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TRADE NAME	MODEL	SET AND FOLDER No.
Admiral	222DX15S, 222DX16, 222DX17, 222DX26, 222DX27, 222DX48, 222DX49 (Ch. 22C2), 322DX16 (Ch. 22E2) Tel. Rec.	201-2
Crosley	E15BE, CE, SL, TN, WE, E20GN, GY, MN, TN (Ch. 15-20E)	201-3
General Electric	17C125, 20C107, 21C201, 21C202, 21C204, 21C206, 21C208, U, 21C214, 21T1 Tel. Rec. Prod. Chg. Bul. 64	201-1
General Electric	551, 552	201-4
Hoffman	7B104, 7B303, 7M103, 7M302, 7P105, 7P304 (Ch. 190, B), 20B102F, 20M101F (Ch. 194), 21B107, 21B301, 21B504, 21B701 (Ch. 191, B), 21B901 (Ch. 192), 21M106, 21M300, 21M503, 21M700 (Ch. 191, B), 21M900 (Ch. 192), 21P108, 21P505, 21P702 (Ch. 191, B), 21P902 (Ch. 192) Tel. Rec.	201-5
Mopar	609	201-6
Philco	53-T1824, 1825, 1826, 1852, F, L, 1854, L, 2124, L, 2125, L, 2126, 2152, L, 2226, 2227, 2255, L (Codes 123 & 133), 2260, 2262, 2264, 2272, L (Ch. H1 & 81) Tel. Rec.	201-7
Silvertone	1117-17, 1130-17, 1130A-17, 1141-20, 1145-20, 1162-17, 1172-17, 1173-20, 1181-20, 1183-21, 1188-20, 2100, 2150 (Ch. 110.700-100, -104, -120, -140, -150) Tel. Rec.	201-8
Silvertone	2200, 2202, 2203 (Ch. 528.229)	201-9
Sparton	5240, 5241, 5280, 5281 (Ch. 21S212), 5301 (Ch. 21S173-D), 5340, 5341, 5380, 5381 (Ch. 21S213) Tel. Rec.	201-10
Sutco	21-A TV UHF Conv.	201-11
Truetone	D-2205	201-12

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET 194

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General Electric Models 21C201, 21C202, 21C204, 21C206, 21C208, 21C214 and 21T1 were covered in Photofact Folder 2, Set 194.

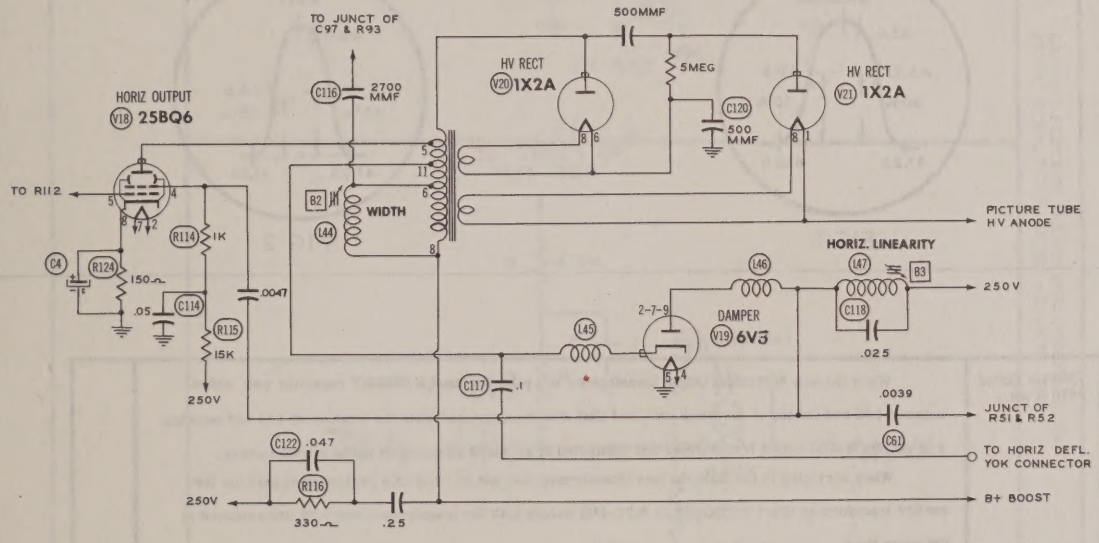
Models 17C125, 20C107, 21C208-U

Three more Models have been added which are very similar to these Models. They are 17C125, 20C107 and 21C208-U.

Model 21C208-U is electrically identical to Model 21C208.

Models 17C125 and 20C107 are electrically identical to the Models covered except Model 17C125 used a 17BP4A picture tube, Model 20C107 uses a 20CP4A or 20DP4A picture tube and a different focus magnet (Part #RLF-058) is used by both Models.

The High-Voltage supply was also changed for the Models using 17" and 20" picture tubes. A voltage doubler circuit is used instead of the tripler circuit employed in the 21" Models. This necessitates the use of a different horizontal output transformer (Part #RTO-125). A partial schematic showing the revised high-voltage circuit for the 17" and 20" models is given below.



Chassis Coded #420

In later production the diode load resistor (R40) was changed from 3.9KΩ to 3KΩ and the Video IF alignment was revised. A revised IF Alignment chart is given on the reverse side. For tuner and sound alignment refer to Photofact Folder 2 in Set 194.

Chassis Coded #430

In some receivers a different horizontal output transformer and deflection yoke are used. In receivers which use the different horizontal output transformer and yoke a label has been placed on the high voltage compartment which specifies the correct replacement part. The new part number, for Models 17C125 and 20C107, is RTO-130, and for all 21" Models, is RTO-129. The new yoke used in all Models is part #RLD-150.

(Continued on Reverse Side)

GENERAL ELECTRIC MODELS 17C125, 20C107, 21C201 21C202, 21C204, 21C206, 21C208, -U, 21C214, 21T1

PRODUCTION CHANGES
BULLETIN 64

PRODUCTION CHANGES
BULLETIN 64

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VIDEO IF ALIGNMENT

Connect a 100KΩ, 1/2 watt, resistor across R75 during alignment to cutoff noise inverter section of V12 and prevent it from distorting the response curve.
Connect the negative lead of a 3 volt bias battery to the ungrounded side of C38.
Connect the positive lead to chassis.
Tune receiver to channel where rotation of fine tuning control does not change shape of response curve.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of 6CB6 (V6). Low side to chassis.	44MC (15MC Sweep)	38.0MC 44.6MC	Any non-interfering channel.	Vert. amp. to point (A). Low side to chassis.	A1, A2	Adjust A1 for MINIMUM response at 38.0MC. Adjust A2 for maximum response at 44.6MC.
2.	"	High side to point (B). Low side to chassis.	44MC (10MC Sweep)	41.25MC	"	"	A3	Adjust for MINIMUM marker response.
3.	"	"	"	47.25MC	"	"	A4	"
4.	"	"	"	45.75MC 42.5MC 44.15MC	"	"	A5, A6, A2	Adjust for response similar to Fig. 1 with markers as shown. A5 affects 45.75MC placement. A6 affects 42.5 placement and A2 affects 44.15MC placement.
5.	"	High side to point (C). Low side to chassis.	"	38.0MC	"	"	A7	Adjust for MINIMUM marker response.
6.	"	"	"	47.25MC	"	"	A8	"
7.	"	"	"	44.15	"	"	A9, A10	Adjust simultaneously for maximum gain at 44.15MC with symmetrical response. Similar to Fig. 2. If necessary, retouch A2, A5 and A6 for desired response.

IF A TUNER ALIGNMENT IS NOT INTENDED, PERFORM STEPS 19 AND 20 (PAGE 7, PHOTOFACT FOLDER 2, SET 194) AS A PART OF VIDEO IF ALIGNMENT.

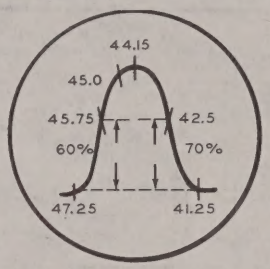


FIG 1

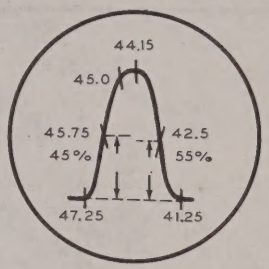


FIG 2

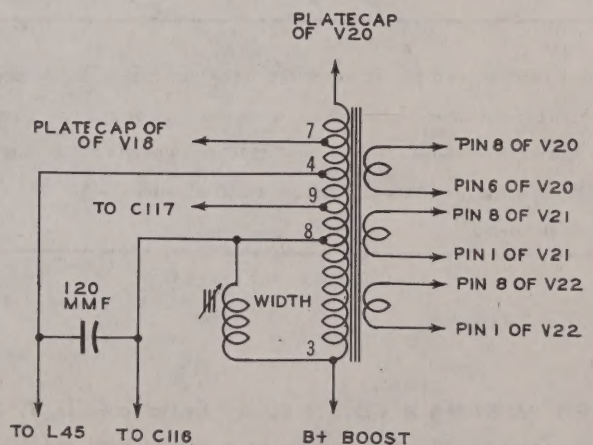
Chassis Coded #430 (Cont.)

When the new horizontal output transformer and yoke are used, a 120MMF capacitor was added between L45 and the top of the width coil, and C117 was disconnected from the junction of L45 and terminal 9 of the horizontal output transformer and connected to an added terminal on the new transformer.

When servicing in the field, the new transformer may not be used as a replacement part for the earlier transformer (Part # RTO-125 or RTO-126) unless both the transformer and yoke are replaced at the same time.

A schematic drawing showing the connections to the new transformer is given below. The connections to the new yoke remain the same.

In addition, changes covered in Code #420 above are included in Chassis Coded #430.



(Continued on Next Page)

Chassis Coded #401

A delayed AGC circuit for the 2nd. RF Amplifier was added in all chassis coded 401 and up. Receivers using this circuit may be identified by the inclusion of a two-position switch labeled "LOCAL-FRINGE STABILIZER" on the rear of the cabinet in place of the original switch and potentiometer.

In the new circuit the 1st and 2nd IF Amplifiers receive non-delayed AGC bias as before except R27 is changed from 2.2Meg to 470KΩ. Approximately ½ of this AGC bias is applied to the 3rd IF Amplifier by adding a 100KΩ resistor, bypassed by a .1MFD capacitor, from the junction of R38 and R39 to the bottom of R34. A partial schematic of this circuit is given in Fig. 3 below.

The delayed AGC bias for the 2nd RF Amplifier is obtained by omitting R7 (AGC Control), R28, R71, R78, C38 and C85 and adding the circuit shown in Fig. 4 below, in place of the above components. In the new circuit, the unused diode (Pin 6) of V10 (6T8) is removed from the ground and used as AGC Clamper. 155 volts is obtained from the screen (Pin 6) of V8.

In addition, changes covered in Codes #420 and 430 above are included in Chassis Coded #401.

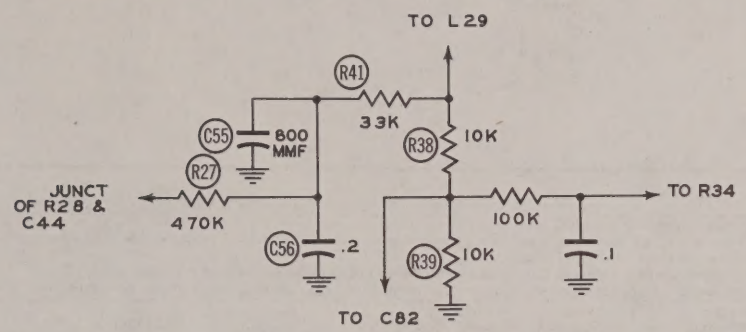


FIG. 3

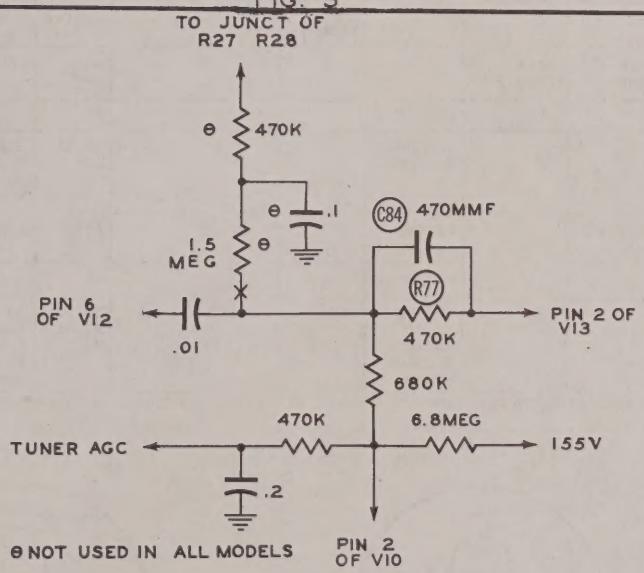


FIG. 4

Chassis Coded #1140

In all chassis coded 1140, the Video Amplifier and its related components were changed. In the new circuit a 6BK7-A tube is used instead of the original 12BH7 tube.

Since the 6BK7-A has a 450MA heater, the filament string was changed as follows: The 6BK7-A tube was inserted at the end of the filament string with pin 5 grounded, and pin 4 connected to point "X" as well as the filament string so that the filament operates partially in series with the other filaments and partially from the filament transformer.

A partial schematic showing the new video amplifier circuit is given on the reverse side.

In addition, the Video IF Alignment is changed for all sets using the 6BK7-A Video Amp. An alignment chart, for use when the Video Amplifier is a 6BK7-A only, is given on the reverse side. For alignment of sets using a 12BH7 Video Amp. refer to chart on the preceding page.

In addition to the above, the 5MMF video coupling capacitor located in the detector can assembly was changed to 9MMF.

Chassis coded #1140 also contains changes coded 401, 430 and the 3KΩ diode load resistor above.

(Continued on Reverse Side)

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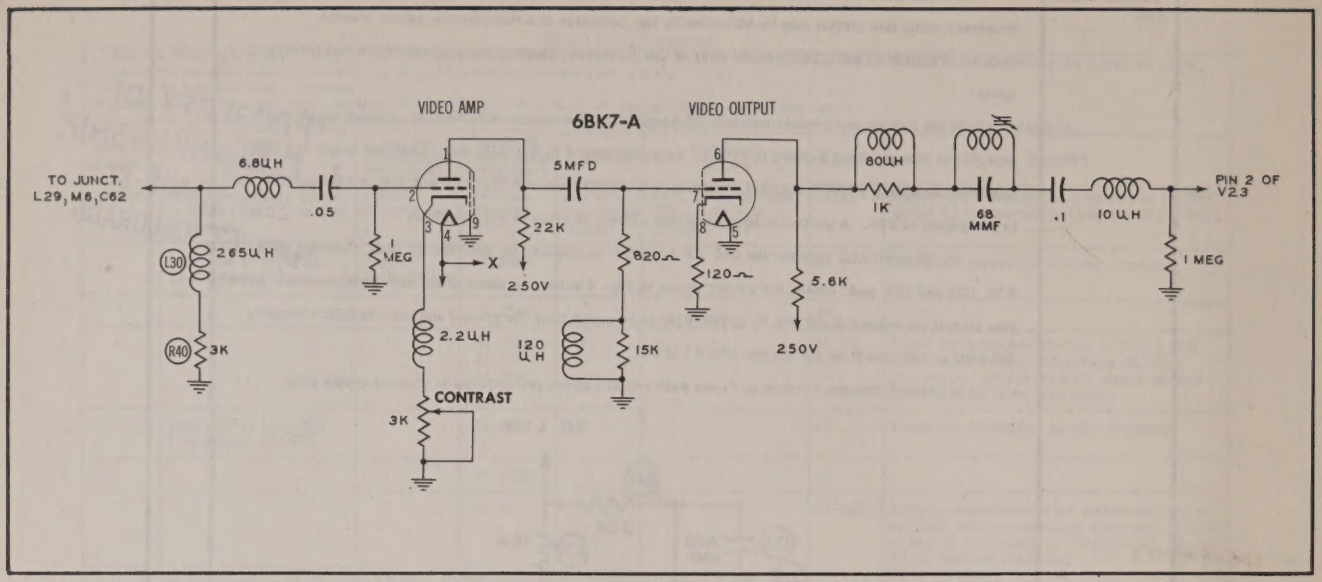

VIDEO IF ALIGNMENT FOR CHASSIS USING 6BK7-A VIDEO AMPLIFIER

Connect a 100KΩ, 1/2 watt, resistor across R75 during alignment to cutoff noise inverter section of V12 and prevent it from distorting the response curve.
Connect the negative lead of a 3 volt bias battery to the ungrounded side of C38, connect the positive side to chassis.
Connect a jumper between the tuner AGC and IF AGC.
Tune the receiver to channel where rotation of fine tuning control does not change the shape of response curve.
Connect the schronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (grid) of 6CB6 (V6). Low side to chassis.	44MC (15MC Swp)	38.0MC 44.6MC	Any non-interfering channel	Vert. Amp. to point (A). Low side to chassis.	A1, A2	Adjust A1 for MINIMUM response 38.0MC. Adjust A2 for maximum response at 44.6MC.
2.	"	High side to point (B). Low side to chassis.	44MC (10MC Swp)	41.25MC	"	"	A3	Adjust for MINIMUM marker response.
3.	"	"	"	47.25MC	"	"	A4	"
4.	"	"	"	45.75MC 42.5 MC	"	"	A5, A6, A2	Adjust for response similar to Fig. 5. with markers as shown. A5 affects 45.75MC placement, A6 affects 42.5 placement, A2 affects symmetrical response.
5.	"	High side to point (C). Low side to chassis.	"	38.0MC	"	"	A7	Adjust for MINIMUM marker response.
6.	"	"	"	47.25MC	"	"	A8	"
7.	"	"	"	41.25MC 42.5MC 45.0MC 45.75MC 47.25MC	"	"	A9, A10, A2, A5, A6	Adjust A9, A10 for maximum gain with flat top. Adjust A5 and A6 for response similar to Fig. 6 with markers as shown. A5 affects 45.75MC placement. A6 affects 42.5MC placement. Adjust A2 to correct for tilt.

IF TUNER ALIGNMENT IS NOT INTENDED PERFORM STOPS 19 AND 20 (PAGE 7, PHOTOFACT FOLDER 2, SET 194) AS A PART OF VIDEO ALIGNMENT.

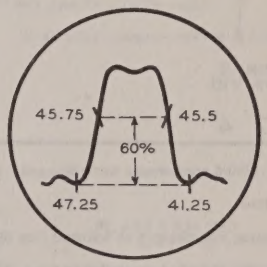

FIG. 5

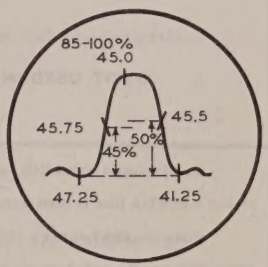

FIG. 6

PHOTOFACT* Folder

ADMIRAL
CHASSIS 22C2, 22E2

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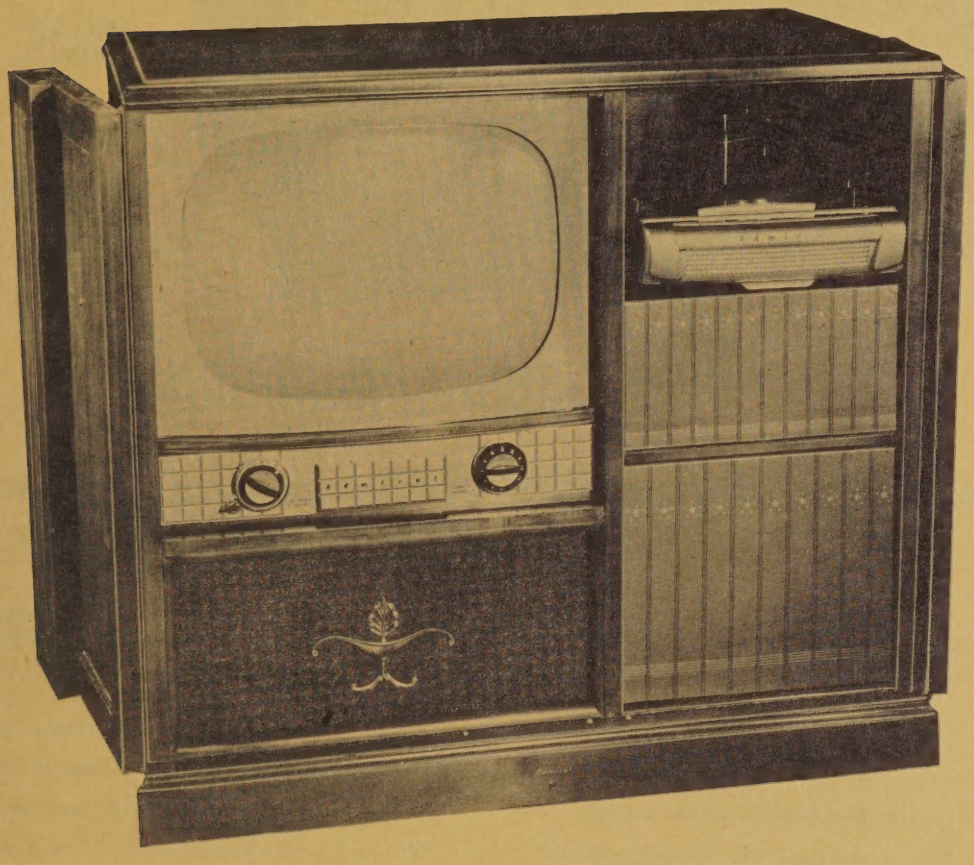
IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 322DX16

ADMIRAL
CHASSIS 22C2, 22E2

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DATE 4–53 SET 201 FOLDER 2

ADMIRAL
CHASSIS 22C2, 22E2

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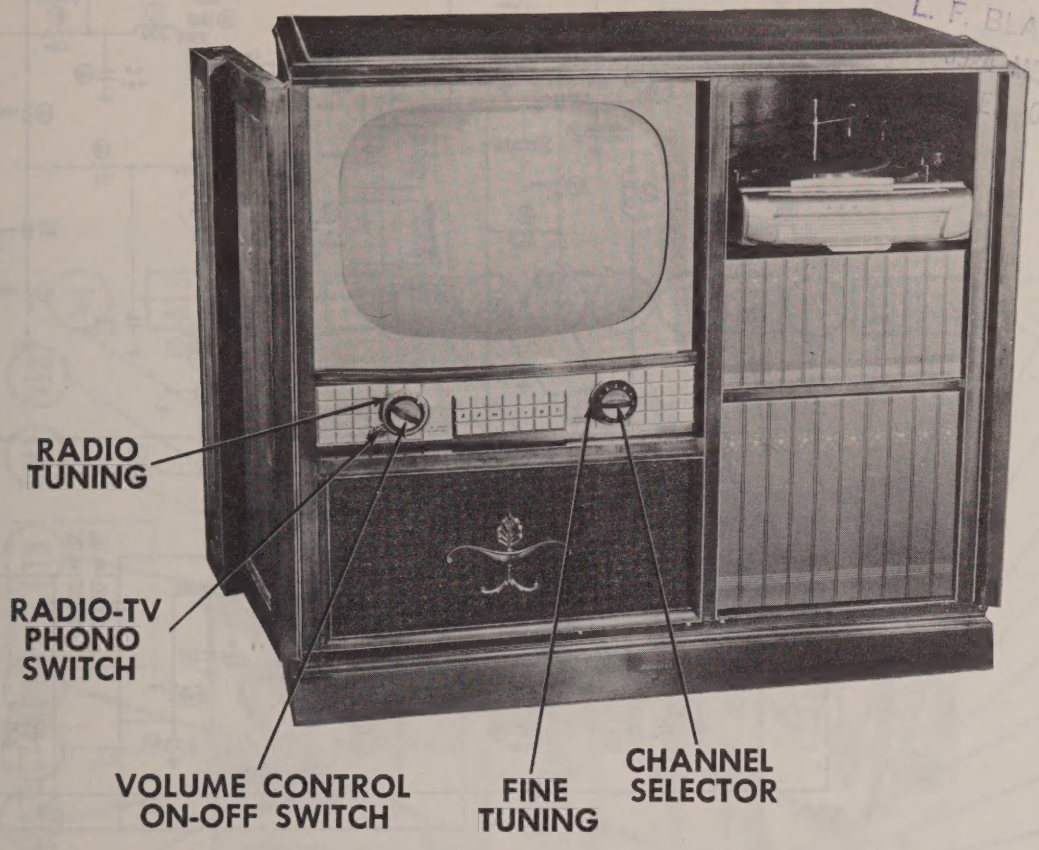

ADMIRAL
CHASSIS 22C2, 22E2

ADMIRAL MODEL 322DX16

TRADE NAME	Admiral Models 222DX15S, 222DX16, 222DX17, 222DX26, 222DX27, 222DX48, 222DX49 (Ch. 22C2), 322DX16 (Ch. 22E2)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois
TYPE SET	TV-AM-Phono Combination Receiver
TUBES	Twenty-Four
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.7 Amp. @ 117 Volts AC
TUNING RANGE	TV Channels 2 thru 13, Video IF 25.75MC, TV Sound IF 21.25MC (Intercarrier), AM530-1620KC, AM Sound IF 455KC.

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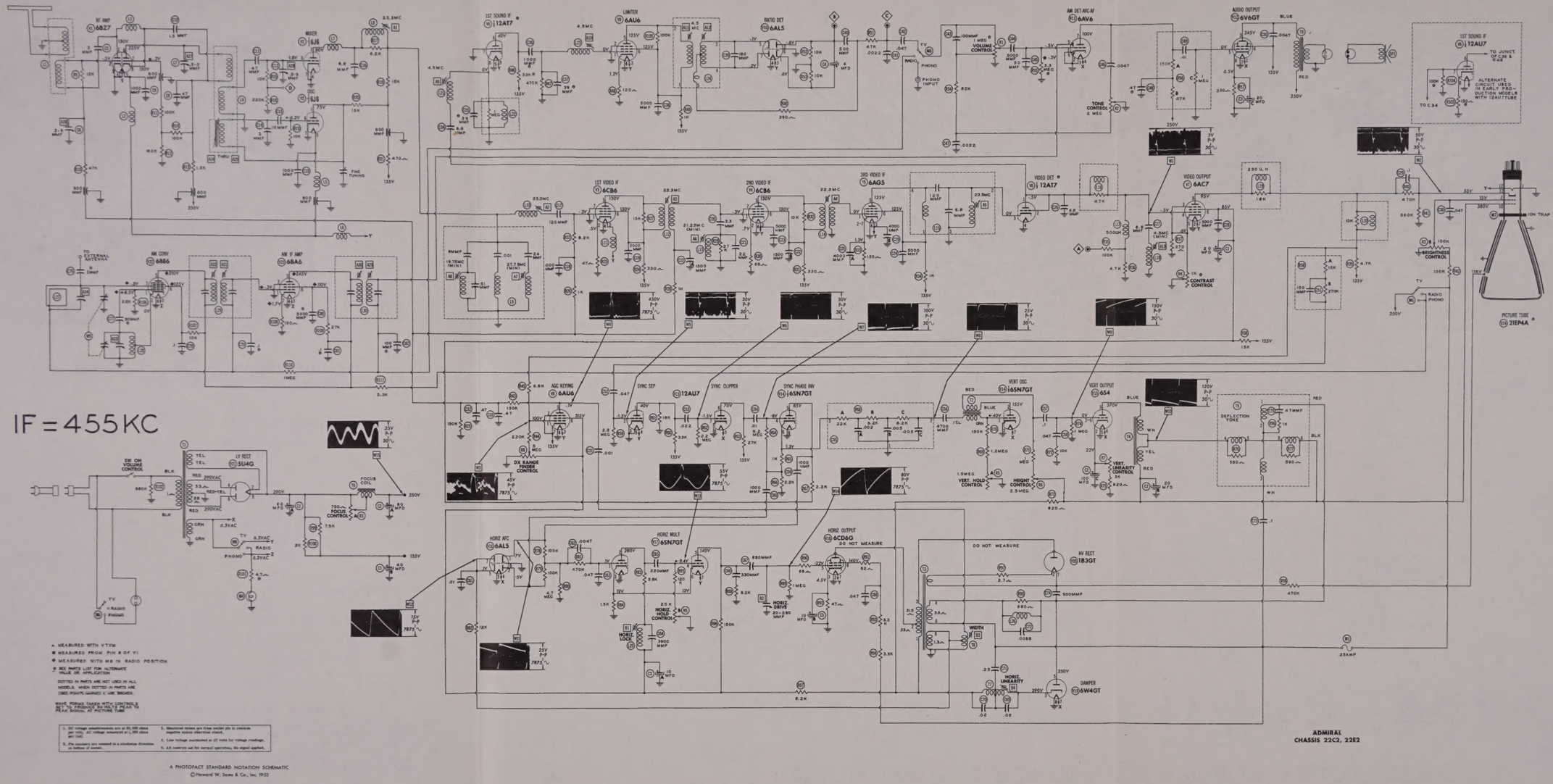

▲ MEASURED WITH VTVM
● MEASURED FROM PIN 8 OF V1
◆ MEASURED WITH M8 IN RADIO POSITION
⊘ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED, POINTS MARKED X ARE BRIDGED.

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS P-P AT PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements are at 30,000 ohms per volt. AC voltage measured at 1,000 ohms per volt.
2. Tie numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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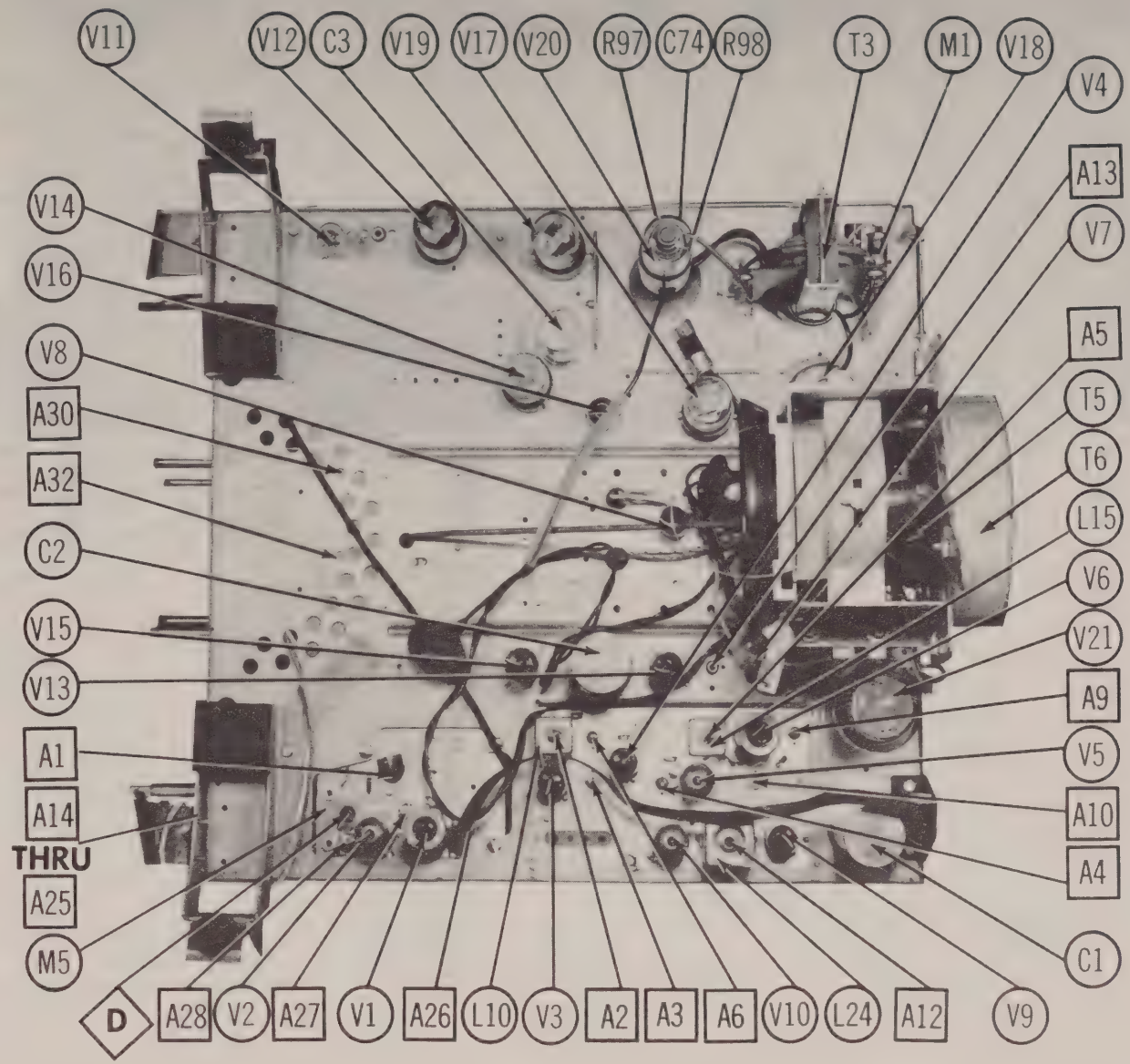

CHASSIS TOP VIEW

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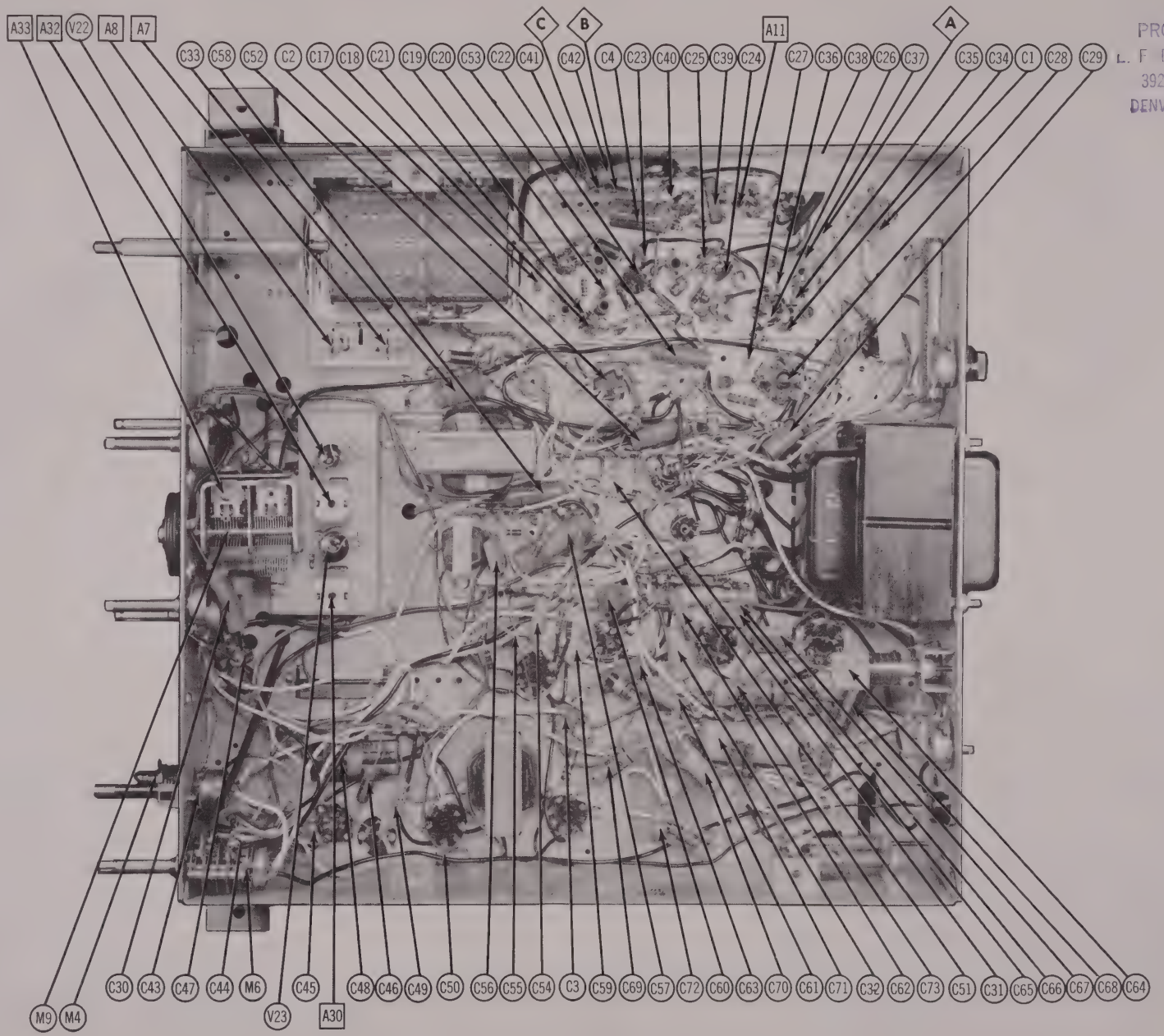

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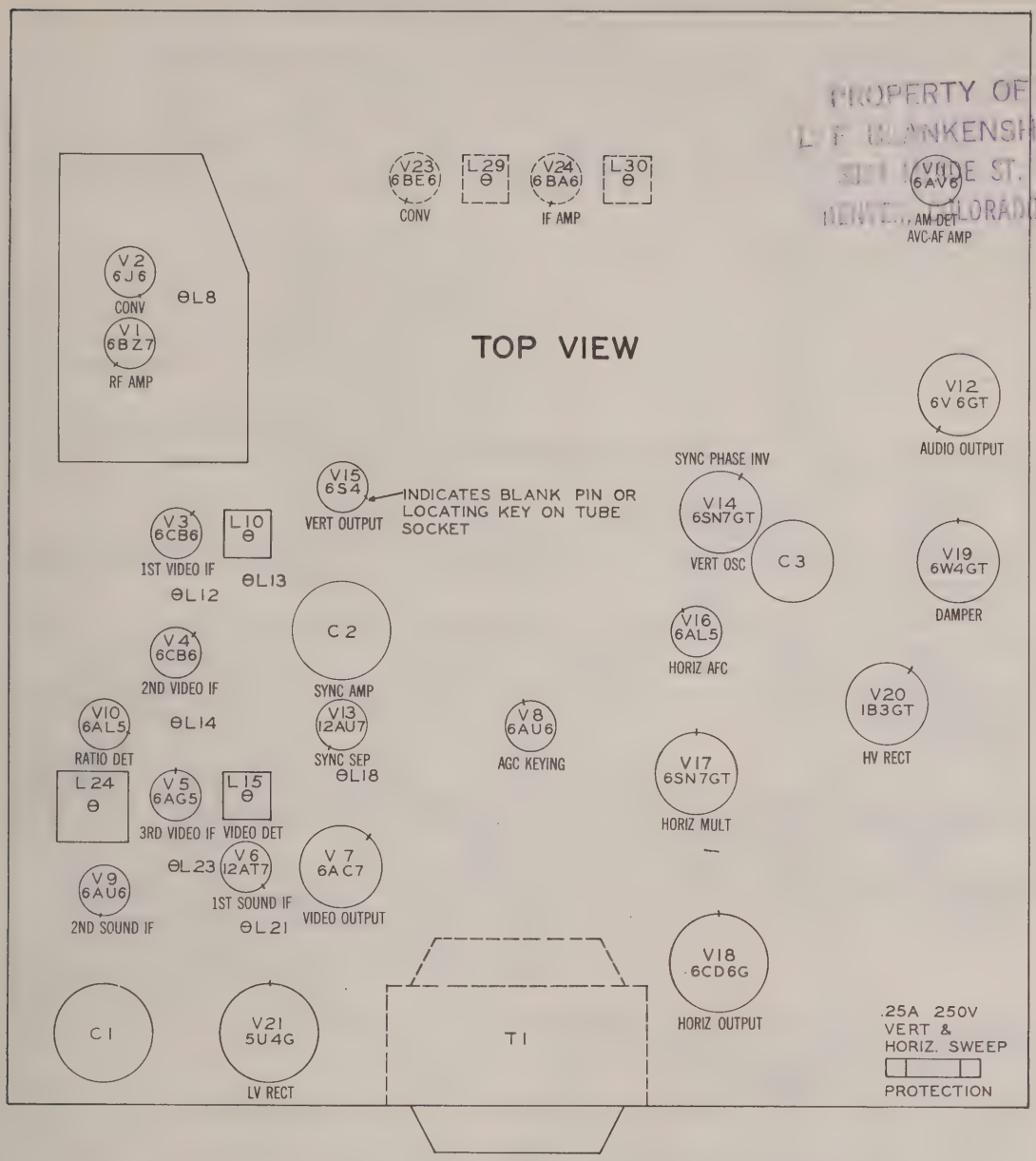
CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound- V21

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster,-V7, V24
Has pic, no sound-V6, V9, V10, V11, V12
Overloaded picture-V8

SYNC FAILURE
No vert. sync.-V14
No horiz. sync.-V14, V16, V17
No vert. or horiz. sync.-V13, V14

SWEEP FAILURE
No raster, has sound-V17, V18, V19, V20, V24 Fuse (M1)
No vertical deflection-V14, V15
Poor vert. linearity or foldover-V14, V15
Poor horiz. linearity or foldover-V17, V18, V19
Narrow picture-V17, V18, V19, V20, V21
Vert. off freq.-V14
Horiz. off freq.-V14, V16, V17

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C33. Connect the positive lead to chassis.
Set contrast control to minimum (fully counterclockwise).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.3MC (Unmod)	Any	DC probe to point (A). Common to chassis.	A1, A2, A3	Adjust for maximum deflection. Attenuate generator to maintain approximately 1 volt of VTVM.
2.	"	"	22.3MC	"	"	A4	"
3.	"	"	23.5MC	"	"	A5	"
4.	"	"	21.25MC	"	"	A6	Adjust for MINIMUM deflection.
5.	"	"	27.75MC	"	"	A7	Use 1.5 volt bias. Adjust for MINIMUM deflection.
6.	"	"	19.75MC	"	"	A8	"
7.	"	"	25.3MC	"	"		Use 3 volt bias. Readjust A1 and A2 for maximum.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Connect 3 volt bias battery and set contrast control as under Video IF Alignment.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.25MC 22.0MC 24.3MC 25.0MC 25.75MC	Any	Vert. Amp. to point (A). Low side to chassis.		Check for response curve similar to Fig. 1. If necessary retouch A1 thru A5 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to pin 1 (plate) of 12AT7 (V6A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B). Common to chassis.	A9, A10, A11	Adjust for maximum deflection. Attenuate generator to maintain approximately 1 volt at VTVM.
10.	"	"	"	"	DC probe to point (C). Common to chassis.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to pin 1 (plate) of 12AT7 (V6A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point (B). Low side to chassis.	A9, A10, A11	Disconnect stabilizer capacitor C4. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
10.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A12	Reconnect capacitor C4. Adjust so that 4.5MC occurs at center of crossover lines as in Figure 3. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Connect a 10MMF capacitor from pin 8 of V7 to pin 8 of V6B.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.01MFD	High side to pin 1 (plate) of 12AT7 (V6A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B). Common to chassis.	A13	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft.
The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A14	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A15	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A16	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A17	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A18	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A19	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A20	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A21	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A22	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A23	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A24	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A25	

TV ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (D). Low side to chassis.	A26, A27, A28	Adjust for response curve similar to Fig. 5.
14.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel make slight compromise adjustments of A26, A27 and A28 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

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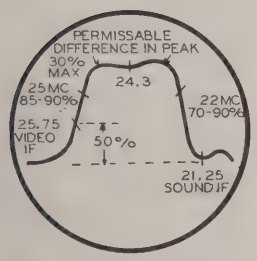


FIG. 1

FIG. 2

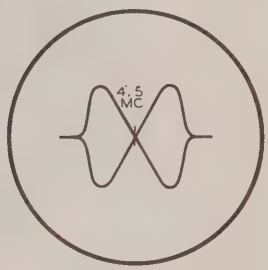


FIG. 3

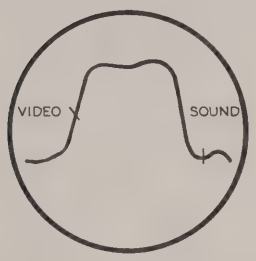


FIG. 4

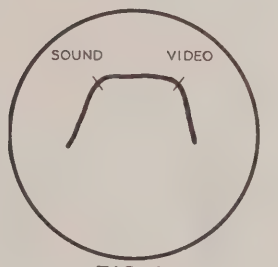


FIG. 5

RADIO ALIGNMENT INSTRUCTIONS

RADIO ALIGNMENT

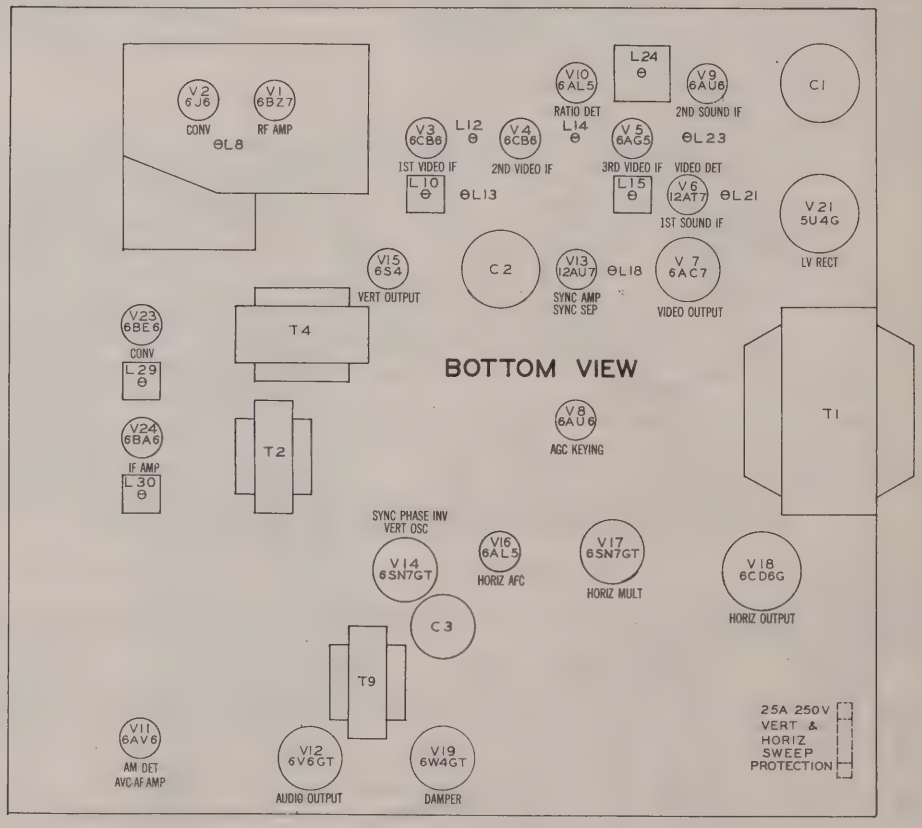
Turn tone control fully clockwise.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
15.	.1MFD	High side to stator plates of antenna section of tuning gang. Low side to chassis.	455KC (400~ Mod)	Radio	Tuning gang fully open.	Across voice coil.	A29, A30 A31, A32	Adjust for maximum output.
16.	"	"	1620KC	"	"	"	A33	"
17.		Loop.	1400KC	"	Tune to 1400KC signal.	"	A34	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

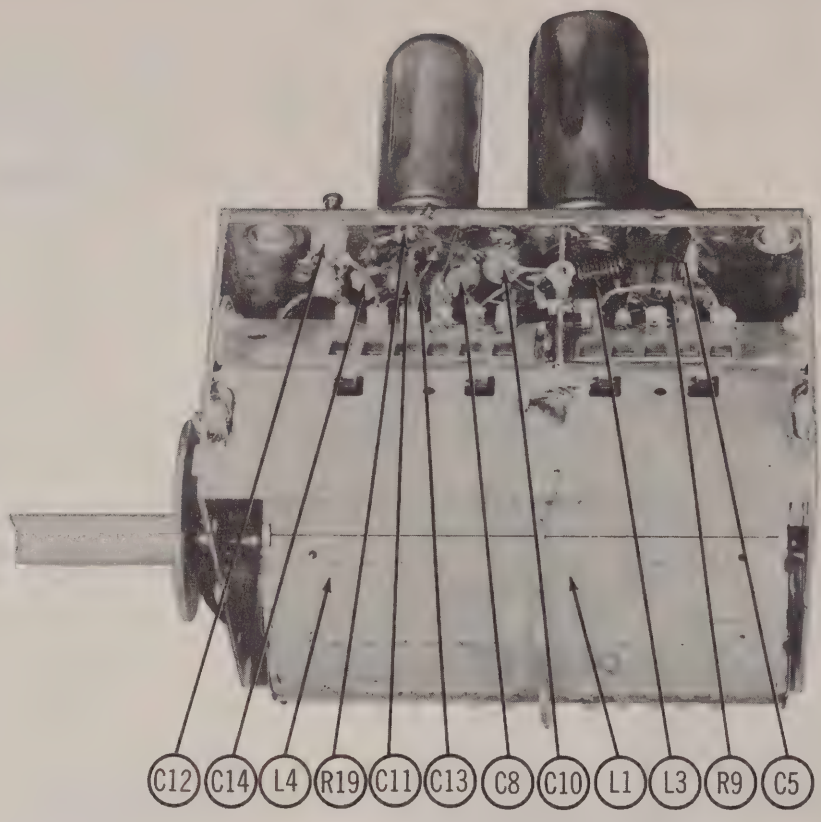
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	INF	200KΩ	0Ω	0Ω	.1Ω	†1.7KΩ	†170KΩ	INF	0Ω
V 2	6J6	†17KΩ	†17KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	160KΩ	47Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 4	6CB6	150KΩ	68Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 5	6AG5	.4Ω	150Ω	.1Ω	0Ω	†3.2KΩ	†3.2KΩ	150Ω		
V 6	12AT7	4.7KΩ	4.7KΩ	.2Ω	0Ω	0Ω	†35KΩ	0Ω	.8Ω	.1Ω
V 7	6AC7	0Ω	0Ω	170Ω	4.7KΩ	170Ω	†17KΩ	.1Ω	†7KΩ	
V 8	6AU6	†14KΩ	†2.3KΩ	.1Ω	0Ω	300KΩ	#8.2KΩ	†2.3KΩ		
V 9	6AU6	470KΩ	0Ω	.1Ω	0Ω	†3.3KΩ	†3.3KΩ	120Ω		
V 10	6AL5	10KΩ	10KΩ	.1Ω	0Ω	INF	0Ω	INF		
V 11	6AV6	3.3Meg	0Ω	0 Ω	.1Ω	♦750KΩ	0Ω	†200KΩ		
V 12	6V6GT	INF	.1Ω	†2.6KΩ	†2.3KΩ	1 Meg	†47KΩ	0Ω	330Ω	
V 13	12AU7	†2.3KΩ	2.2Meg	0Ω	.1Ω	.1Ω	†30KΩ	2.2Meg	0Ω	0Ω
V 14	6SN7GT	1.8Meg	#1.5Meg	0Ω	8.2Meg	†20KΩ	3.2KΩ	.1Ω	0Ω	
V 15	6S4	INF	2.2KΩ	\ 1 Meg	.1Ω	0Ω	1 Meg	INF	INF	#1.9KΩ
V 16	6AL5	4.8Meg	4.8Meg	0Ω	.1Ω	12KΩ	0Ω	12KΩ		
V 17	6SN7GT	5 Meg	#14KΩ	1.5KΩ	125KΩ	#160KΩ	1.5KΩ	.1 Ω	0Ω	
V 18	6CD6G	1 Meg	0Ω	47Ω	INF	1 Meg	#14KΩ	.1Ω	†6.6KΩ	Top Cap #45Ω
V 19	6W4GT	INF	INF	4 Meg	INF	†230Ω	INF	.1Ω	0Ω	
V 20	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap #360Ω
V 21	5U4G	INF	30KΩ	INF	33Ω	INF	28Ω	INF	30KΩ	
V 22	6BE6	22KΩ	.7Ω	♦.1Ω	0Ω	♦†5.5KΩ	♦†15KΩ	♦1.7Meg		
V 23	6BA6	♦1.7Meg	0Ω	♦.1Ω	0Ω	♦†5.5KΩ	♦†32KΩ	150Ω		
V 24	21EP4A	0Ω	†35KΩ	Pin 10 #820Ω	Pin 11 †270KΩ	Pin 12 .1Ω				

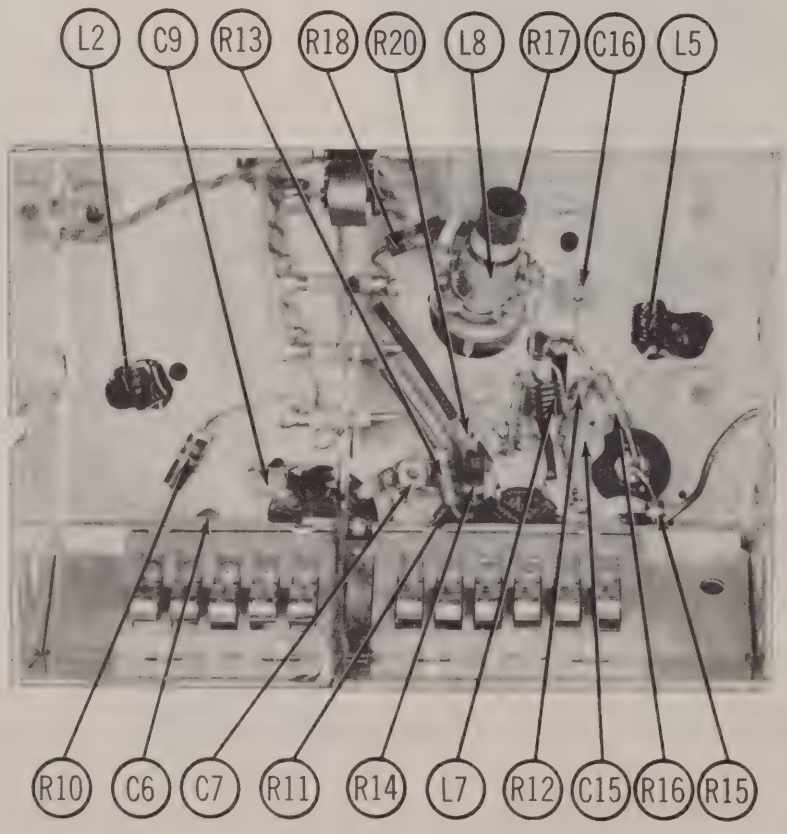
ALL MEASUREMENTS TAKEN IN "TELEVISION" POSITION UNLESS OTHERWISE SPECIFIED
♦ MEASURED IN RADIO POSITION
† MEASURED FROM PIN 8 OF V21
# MEASURED FROM PIN 3 OF V19



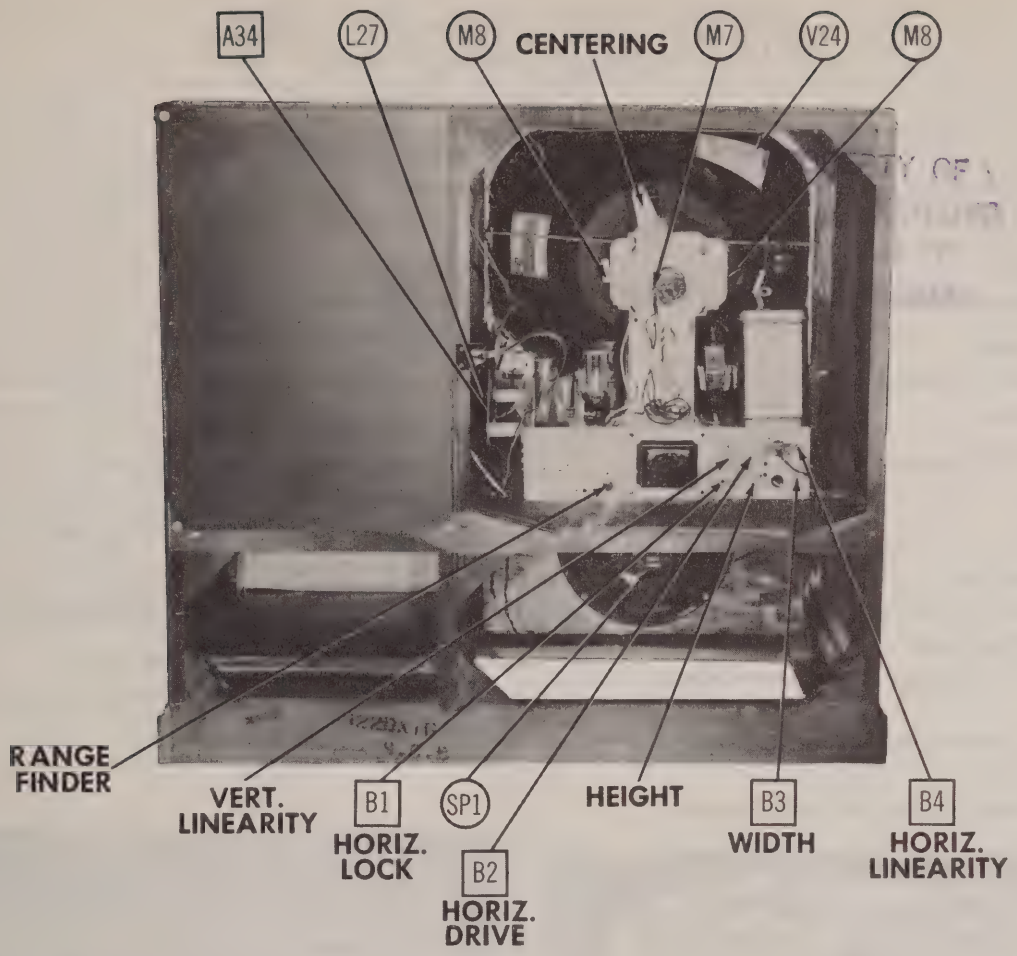
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the mid-position of its range.

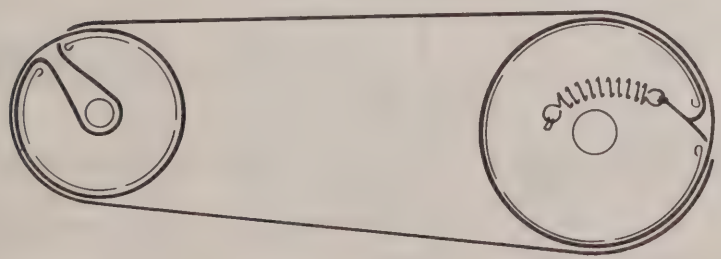
Adjust the horizontal lock slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of a vertical white line or compression of the center of the picture.

Adjust the width control slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

TUNING GANG FULLY CLOSED



DRIVE CORD STRINGING

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Check T5A and associated components located in yoke . See loss of high voltage.

INSUFFICIENT SWEEP

Check setting of drive and width control.

Check waveform W14:

If Unsatisfactory	If Satisfactory
Substitute V17 and check associated components.	Substitute V18 and V19. Check C68, C72 and components of yoke.

DRIVE LINES

Check setting of drive control (B2). Substitute V18 and V19.

PIE CRUST EFFECT (Fig. 1)

Check horizontal AFC filter capacitor C63 for open.

COMPRESSED AT LEFT SIDE

Substitute V18 and V19. Check T5A and other components of yoke.

FOLDS

Substitute V19 . Check associated components.

XMAS TREE EFFECT

Substitute V17. Check C66 and C67. Check associated components.

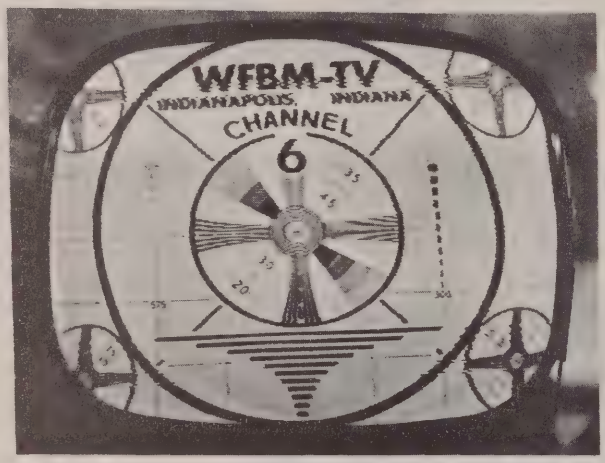


Fig. 1

VERTICAL

LOSS OF SWEEP

Substitute V14 and V15.

Check waveform at W9:

If Unsatisfactory	If Satisfactory
Check T2 and associated components	Check vertical output transformer T4.

INSUFFICIENT SWEEP

Follow procedure outlined under loss of vertical sweep.

COMPRESSED AT BOTTOM

Check C57 for leaky condition. Check C2c in vertical output tube cathode for open.

COMPRESSED AT TOP, STRETCHED AT BOTTOM

If adjustment of heights and vertical linearity control does not correct this condition, check C58 and R72.

UNCONTROLLABLE VERTICAL OSCILLATOR (Fig. 2)

Check C58 in vertical output grid circuit for open.

FOLDS

Substitute V14 and V15. Check associated components.

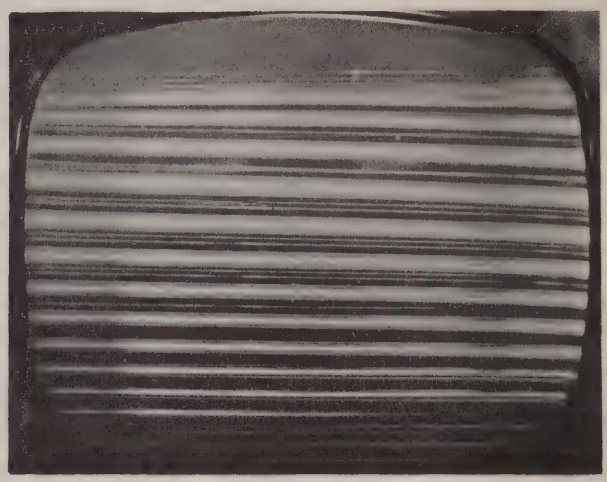


Fig. 2

SYNC

HORIZONTAL

LOSS OF SYNC

Check waveform at W13;

If Unsatisfactory	If Satisfactory
Substitute V13 and V14. Check circuit components.	Check waveform W12.

Check waveform W12:

If Unsatisfactory	If Satisfactory
Check feedback network R82 and C61. Substitute V16.	Substitute V17. Check associated components particularly L25 and C64.

CRITICAL HOLD

Substitute V13, V14, V16 and V17. If this does not correct trouble, follow procedure outlined under horizontal loss of sync.

PULLING PICTURE

Substitute V16 and V17. Check circuit components , particularly C62. If picture still pulls, try substituting power transformer as there may be leakage between filament and high voltage windings.

VERTICAL

LOSS OF SYNC

Check waveform W8:

If Unsatisfactory	If Satisfactory
Substitute V13 and V14. Check associated components especially the integrator.	Substitute V14 and V15, Check associated components.

CRITICAL HOLD

Substitute V13 and V14. Check circuit components, particularly C52 and C54.

TRIGGERING

Substitute V14 and V15. Check filament lead dressing away from grid leads.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6AG5	6AG5	7BD	
V6A	Video Detector-1st. Sound IF Amp.	12AT7	12AT7	9A	
B	Video Detector-1st. Sound IF Amp.	12AU7	12AU7	9A	Used in early production of 22C2 Chassis.
V7	Video Output	6AC7	6AC7	8N	
V8	AGC Keying	6AU6	6AU6	7BK	
V9	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AM Detector-AVC-AF Amplifier	6AV6	6AV6	7BT	
V12	Audio Output	6V6GT	6V6GT	7S	
V13	Sync Amplifier - Sync Separator	12AU7	12AU7	9A	
V14	Sync Phase Inv.-Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V15	Vert. Output	6S4	6S4	9AC	
V16	Horiz. AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6CD6G	6CD6G	5BT	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	5U4G	5U4G	5T	
V22	Converter	6BE6	6BE6	7CH	22E2 Chassis only
V23	IF Amplifier	6BA6	6BA6	7BK	22E2 Chassis only

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CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V24	21EP4A	21EP4A		12D	① Circuit changes necessary
		21EP4 ①		12D	
		21FP4 ①		12C	
		21FP4A ①		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▬60	400	67C15-21	AFH4-103		BO48		FP378	TVL-2770	
B	■40	350				BR4035			TVA-1608	
C	▲20	350								
C2A	■80	350	67C15-18	AFH3-182		C141		FP235	TVL-3722	
B	▬20	450						TC3501		
C	▲100	50								
C3A	■10	450	67C15-19	AFH3-125		BO63		FP345-2	TVL-3731	
B	10	25				BR102A				
C	▲20	25								
C4	4	50	67A4-9	PRS150/4		BR550		TC30	TVA-1303	
C5	3		94D47-54							
C6	3-9		98A45-96		829-10					
C7	.5-3		98A45-23		829-3			CT565A		
C8	47		94D47-50	BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C9	1000		98A45-24	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C10	1.5		94D46-84	S11.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C11	47		94D47-50	BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C12	.5-3		98A45-23		829-3			CT565A		
C13	10		94D47-51	S110NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C14	5		94D47-52	SI5N750	TCN-5		N750K-050	NT-555	5TCU-V5	
C15	1000		98A45-24	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C16	6.8		94D47-53	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C17	120		65B1-10	S1120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C18	1000		65C6-41	S11000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C19	5000		65C10-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C20	3.3		65C6-89	SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C21	22		65C6-47	S122NP0	TCZ-22		NP0K-220	ZT-5422	5TCC-Q22	
C22A	1500		65A17-2	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C23	5000		65C10-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C24	5000		65C10-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C25A	4000		65A17-1	BPD-2X004	D6-402	TM5DD4	822-004	DCD-524	5HK-2D4	
B					D6-402					
C26	6.8		65C6-71							
C27	6.8		65C6-71							
C28	5000		65C10-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C29	.1	400	64B5-5	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C30	.047	400	64B9-9	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C31	.001	600	64B9-19	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C32	.47	100	64A10-1	P288-5		PJ4P47		PT405	2TM-P47	
C33	.47	100	64B9-53	P288-5		PJ4P47		PT405	2TM-P47	
C34	6.8		65C6-71	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C35	39		65C6-88	SI39NP0	TCZ-39		NP0K-390		5TCC-Q39	Note 1
C36	1000		65C6-41	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	Note 2
C37	39		65C6-88	SI39	D6-390	5W5Q4	GP1K-390	UC-5439	5GA-Q39	Note 3
C38	5000		65C10-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C39	180		65C6-59							
C40	500		65C6-6	SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C41	.0022	600	64B9-17	P688-0022	D6-222	PT6222	GP2-333-222	PT6222	6TM-D22	
C42	.047	400	64B9-9	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C43	100		65C6-3	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C44	5000		65C10-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C45	50		65C6-4	SI50	D6-500	TM5Q5	GP1K-500	UC-545	5GA-Q5	
C46	.0047	600	64B9-15	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C47	.0022	600	64B9-17	P688-0022	D6-222	PTE6D22	GP2-333-222	PT0222	6TM-D22	
C48	.47	400		484-5		PTE4P5		PT405	4TM-P47	Note 4
C49	.01		†63B6-3	P688-01	†PC-177	PTE5B1	GP2-333-103	PT611	6TM-S1	
C50	.0047	600	64B9-15	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C51	150		♯ 63B6-4	SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C52	.047	400	64B9-9	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C53	.022	400	64B9-11	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C54	.01	400	64B9-13	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C55A	.002			P688-002		PTE6D2		PT623		
B	.005		♦63B6-2	P688-005	♦PC-100	PTE6D5	♦1406-01	PT625	♦10IC1	
C	.005			P688-005		PTE6D5		PT625		
C56	4700	500	65B21-472	1454-005		IDR5D5		MCB465	MS-25	
C57	5	500	64B5-5	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C58	.047	600	64A2-14	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C59	1000	500	65B21-102	1468-001	D6-102	1W5D1	GP2L-102	MC455	1FM-21	
C60	1000	500	65B21-102	1468-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C61	.01	400	64B9-13	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C62	.0047	600	64B9-15	P688-0047	D6-472	PTE6D47	GP2-333-472	PT624	6TM-D47	
C63	.047	400	64B9-9	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C64	3900	500	65B1-63	1464-004		IDR5D4		MCB463	MS-24	
C65	330	500	65B21-331	1469-00035						
C66	330	500	65B21-331	[illegible]						
C67	680	500	65B21-681							
C68	.047	600	64B8-9	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C69	250	200	64A2-14	P288-05		PT285		PT415	2TM-S5	
C70	.02	400	64A2-9	P488-02		PTE4S2		PT412	4TM-S2	
C71	.25	600	64B5-3	684-25		PTE6P25		PT6025	6TM-P25	
C72	.0068	600	64A2-15							
C73	.1	400	34A2-5	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C74	500	20000	65B18-5	HV20C	TV3-502	MM-C20T5	413-501		20DK-T5	
C75	47	1500	65B1-64							
C76	5		65B1-62	BPD-000005	TCN-5	5W5V5	GP1K-050	UC-555	5GA-V5	Note 5
C77	50		65C6-79	SI50	D6-500	TM5Q5	GP1K-500	UC-545	5GA-Q5	Note 5
C78	.1	400	64A3-15	P488-1	DF-104	PTE4P1		PT401	4TM-P1	Note 5
C79	.1	200	64A3-15	P288-1	DF-104	PTE2P1		PT401	2TM-P1	Note 5
C80	5000		65C10-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	Note 5
C81	.1	400	64A3-15	P488-1	DF-104	PTE4P1		PT401	4TM-P1	Note 5
C82	100		65C6-3	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	Note 5

Note 1. Not used when 1st. Sound IF Amp. is 12AU7.
Note 2. Models having 12AU7 (1st.Sound IF Amp.) use 56MMF in this application (Part #65C6-34)
Note 3. Models having 12AU7 (1st. Sound IF Amp.) use 20MMF in this application (Part #65C6-51)
Note 4. Not used in Ch. 22C2.
† Items C49, R56A, R65B, R65C are combined in one unit.
Items C49, R56A, R56C are combined in one unit (Ch. 22C2) (Part #63B6-5).
♯ Items C51 and R56A, R56C are combined in one unit
♦ Items C55A, C55B, C55C, R68A, R68B, R68C are combined in one unit.
Note 5. Not used in Ch. 22C2

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	75C2-16	Q19-137X	AT-112	BT-74-S	UT-443	Volume Tap② 500KΩ-Note 1
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SW-A	Not Req.	US-26	Attach to R1A
R2A	2 Meg	½	75B13-22	Q11-139	AG-83-S	AB-75	U-56	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	750Ω	2	75B17-1	QJ-425**			WF751	Focus-Wire Wound-Panel
B	100KΩ	½					UR15L	Brightness-Rear
R4A	1000Ω	½	75B13-21	Q17-108	AG-8-S	AB-5	U-4	Contrast-Note 1
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R4A
R5A	1.5Meg	½	75B17-2	QJ-424*			UF26L	Vert. Hold-Panel-Note 2
B	25KΩ	½					UR253L	Horiz. Hold-Rear
R6A	2.5Meg	½	75B13-3	Q11-239	AG-84-S	AB-83	SU-565	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	3000Ω	½	75B13-7	Q11-112	AG-15-S	AB-8	U-8	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	5 Meg	½	75B1-54	Q11-141	AG-85-S	AB-87	SU-67	DX Range Finder
B	Shaft		Not Req.	Not Req.	FS-3	AK-1	Not Req.	Attach to R8A

Note 1. Some models combine the volume & contrast into a dual concentric part No. 75B11-22.
Note 2. In some models the vert. hold & horiz. hold are single controls. Vert. hold part No. 75B13-14, Horiz. hold part No. 75B13-13.
* CONCENTRIKIT EQUIVALENT - KIT K-5, BASE ELEMENTS & SHAFTS B11-138 & P1-121 (Panel) B11-120 & R12-129 (Rear).
** CONCENTRIKIT EQUIVALENT-KIT K-3, BASE ELEMENTS & SHAFTS W13-105 & P3-121 (Panel) B11-128 & R12-131 (Rear).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R9	15KΩ	½	98A45-67	BTS-15K	
R10	47KΩ	½	98A45-17		
R11	100KΩ	½	94C37-87		
R12	160KΩ-5%	½	94D47-59	BTS-160K-5%	
R13	1500Ω	½	94D47-58	BTS-1500	
R14	100KΩ-5%	½	94C37-87	BTS-100K-5%	
R15	10KΩ	½	98A45-18		
R16	220KΩ	½	98A45-21	BTS-220K	
R17	8200Ω	½	[illegible]		
R18	15KΩ	½	98A45-67	BTS-15K	
R19	10KΩ	½	98A45-18		
R20	15KΩ	½	98A45-67	BTS-15K	
R21	470Ω	½	60B8-471	BTS-470	
R22	8200Ω-5%	½	[illegible]	BTS-8200-5%	
R23	4.7Ω	½	60B28-45		
R24	330Ω	½	[illegible]	BTS-330	
R25	150KΩ	½	60B8-154	BTS-150K	
R26	1000Ω	½	[illegible]		
R27	15KΩ-5%	½	60B8-153	BTS-15K	
R28	1000Ω	½	60B8-102	BTS-1000	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R29	27KΩ	½	60B8-273	BTS-27K	
R30	680	½	60B28-44		
R31	330Ω	½	60B8-331	BTS-330	
R32	10KΩ-5%	½	60B7-103		
R33	150Ω	½	60B9-151	BTS-150	
R34	1000Ω	½	60B8-102	BTS-1000	
R35	100KΩ	½	60B8-104	BTS-100K	
R36	4700Ω-5%	½	60B7-472	BTS-4700-5%	
R37	270Ω	½	60B8-271	BTS-270	
R38	15KΩ	1	60B14-153	BTA-15K	
R39	4700Ω	2	60B20-472	BTB-4700	
R40	470KΩ	½	60B8-474	BTS-470K	
R41	560KΩ	½	60B8-564	BTS-560K	
R42	100KΩ	½	60B8-104	BTS-100K	
R43	150KΩ	½	60B8-154	BTS-150K	
R44	220KΩ	½	60B8-224	BTS-220K	
R45	6800Ω	½	60B8-682	BTS-6800	
R46	33KΩ	½	60B8-333	BTS-33K	Note 1
R47	470KΩ	½	60B8-474		
R48	120Ω	½	60B8-121	BTS-120	

RESISTORS (CONT.)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R49	1000Ω	½	60B8-102	BTS-1000	
R50	390Ω	½	60B8-391	BTS-390	
R51	47KΩ	½	60B8-473	BTS-47K	
R52	10KΩ	½	60B8-103	BTS-10K	
R53	10KΩ	½	60B8-103	BTS-10K	
R54	82KΩ	½	60B8-823	BTS-82K	
R55	3.3Meg	½	60B8-335	BTS-3.3Meg	Note 2
R56A	150KΩ	½		BTS-150K	
B	47KΩ	½	† 63B6-3	BTS-47K	
C	1 Meg	1		BTS-1 Meg	
R57	330Ω	1	60B14-331	BTA-330	
R58A	15KΩ	½		BTS-15K	
B	270KΩ	½	† 63B6-4	BTS-270K	
R59	2.2Meg	½	60B8-225	BTS-2.2Meg	
R60	33KΩ	2	60B20-333	BTB-33K	
R61	18KΩ	1	60B14-183	BTA-18K	
R62	2.2Meg	½	60B8-225	BTS-2.2Meg	
R63	27KΩ	2	60B20-273	BTB-27K	
R64	8.2Meg	½	60B8-825	BTS-8.2Meg	
R65	1000Ω	½	60B8-102	BTS-1000	
R66	2200Ω	½	60B8-222	BTS-2200	
R67	2200Ω	½	60B8-222	BTS-2200	
R68A	22KΩ	½		BTS-22K	
B	8200Ω	½	♦ 63B6-2	BTS-8200	
C	8200Ω	½		BTS-8200	
R69	1.2Meg	½	60B8-125	BTS-1.2Meg	
R70	150KΩ	½	60B8-154	BTS-150K	
R71	1 Meg	½	60B8-105	BTS-1 Meg	
R72	10KΩ-5%	½	60B7-103	BTS-10K-5%	
R73	820Ω	2	60B20-821	BTB-820	
R74	1 Meg	½	60B8-105	BTS-1 Meg	
R75	820Ω	½	60B8-821	BTS-820	
R76	560Ω	½	60B8-561	BTS-560	
R77	560Ω	½	60B8-561	BTS-560	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	NOTES
R78	100KΩ-5%	½	60B7-104	BTS-100K-5%	
R79	100KΩ-5%	½	60B7-104	BTS-100K-5%	
R80	4.7Meg	½	60B8-475	BTS-4.7Meg	
R81	470KΩ	½	60B8-474	BTS-470K	
R82	12KΩ	2	60B20-123	BTB-12K	
R83	5600Ω	½	60B8-562	BTS-5600	
R84	1500Ω	½	60B8-152	BTS-1500	
R85	120KΩ	½	60B8-124	BTS-120K	
R86	150KΩ	½	60B8-154	BTS-150K	
R87	8200Ω	1	60B14-822	BTA-8200	
R88	8200Ω	½	60B8-822	BTS-8200	
R89	1 Meg	½	60B8-105	BTS-1 Meg	
R90	68Ω	½	60B28-44		
R91	82Ω	½	60B28-31		
R92	47Ω	1	60B14-470	BW-1-47	
R93	3300Ω	2	60B20-332	BTB-3300	
R94	3300Ω	2	60B20-332	BTB-3300	
R95	680Ω	2	60B20-681	BTB-680	
R96	1000Ω	½	60B8-102	BTS-1000	
R97	2.7Ω	½	60B28-47		
R98	470KΩ	½	60B28-43		
R99	7500Ω	5	61A1-18	1 3/4A-7500	
R100	3000Ω	15	61A3-14	2D-3000	
R101	4.7Ω	½	60B28-49		Note 4
R102	680KΩ	½	60B8-684	BTS-680K	Note 3
R103	150Ω	½	60B8-151	BTS-150	Note 3
R104	100KΩ	½	60B8-104	BTS-100K	Note 6
R105	100KΩ	½	60B8-104	BTS-100K	
R106	22KΩ	½	60B8-223	BTS-22K	
R107	10KΩ	½	60B14-103	BTA-10K	
R108	150Ω	½	60B8 151	BTS-150	
R109	27KΩ	1	60B14-273	BTA-27K	
R110	1 Meg	½	60B8-105	BTS-1 Meg	
R111	5300Ω	5	61A3-16	1 3/4A-6000	

Note 1. Chassis No. 22C2 uses a 47KΩ resistor in this application (Early production only).
Note 2. Some models use a 3.3Meg resistor in this application.
† Items R56A, R56B, R56C, C49 are combined in one unit. In chassis No. 22C2 R56A, R56C, C49 are combined in one unit. (Part No. 63B6-5) R56B is omitted.
♯ Items R58A, R59B, R51 are combined in one unit .
♦ Items R68A, R68B, R68C, C55A, C55B, C55C are combined in one unit.
Note 3. Some models use a 270KΩ (1 Watt)resistor in this application.
Note 4. Used only in chassis No. 22E2.
Note 5. Early production models use a 150Ω resistor in place of L22
Note 6. Used only in early production models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC @ 1.7A	580VCT .225ADC	5VAC @ 3A	6.3VAC @ 9A	80C26-1	P-8161	P-3077	TP-225	R-39BC	

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	190Ω	105Ω	79A18-4	A-8125	A-3003	TBO-5	A-97X	208T9 ⑤	Vert. Osc. Trans.
T3	348Ω tap @ 33Ω	3.6Ω SEC. 2 1.3Ω SEC. 3 0Ω	79D38-1	A-8134	HVO-7①②	TFB-16	D-14①③		Horiz. Output Trans.
T4	1120Ω	7.5Ω	79B40-1	A-8112 ①	A-3037 ①	TSO-8 ①	A-102X	222T1 ①	Vert. Output Trans.
T5A	14Ω		94C30-1	DY-9A ④	MDF-70	TY-3 ⑤	Y-17	21ID2	Horiz. Deflection Coils
B	5Ω								Vert. Deflection Coils
T6	270Ω tap @ 173Ω		69C117-3						Focus Coil -includes centering device
T7	12.5Ω tap @ 7.5Ω		94A28						Horiz. Lin. Coil
T8	10Ω tap @ 3.5Ω		94A39-1						Width Coil

① Drill one new mounting hole.
② Use installation schematic #3.
③ Use with width coil WC-11
④ Use original Horiz. Deflection Coil network
⑤ Use original deflection coil network
⑥ Mount on top of chassis.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T9	5KΩ	3.2Ω	275Ω	.5Ω	79C33-2	A-3877 ①	A-3019 ①	R0-9	S-5X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA ADMIRAL PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	12"	PM	3.2Ω	78B56-1 78B47-2 ①	12J11	12A31	① 10"PM speaker used in Models 222DX15S, 222DX16, 222DX17, 222DX26, 222DX27, 222DX48, 222DX49.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ADMIRAL PART No.	MILLER PART No.	NOTES
L1A	Ant. Coil	0ΩCT	0Ω	94D 46-52		Channel 2.
B	Ant. Coil	0ΩCT	0Ω	94D 46-53		Channel 3.
C	Ant. Coil	0ΩCT	0Ω	94D 46-54		Channel 4.
D	Ant. Coil	0ΩCT	0Ω	94D 46-55		Channel 5.
E	Ant. Coil	0ΩCT	0Ω	94D 46-56		Channel 6
F	Ant. Coil	0ΩCT	0Ω	94D 46-57		Channel 7.
G	Ant. Coil	0ΩCT	0Ω	94D 46-58		Channel 8.
H	Ant. Coil	0ΩCT	0Ω	94D 46-59		Channel 9.
I	Ant. Coil	0ΩCT	0Ω	94D 46-60		Channel 10.
J	Ant. Coil	0ΩCT	0Ω	94D 46-61		Channel 11.
K	Ant. Coil	0ΩCT	0Ω	94D 46-62		Channel 12.
L	Ant. Coil	0ΩCT	0Ω	94D 46-63		Channel 13.
L2	Fil. Choke	0Ω		98A 45-13		
L3	Neutr. Coil	0Ω		94C 37-89		
L4A	RF Mixer Grid & Osc.	0Ω		94D 46-72		Channel 2.
B	RF Mixer Grid & Osc.	0Ω		94D 46-73		Channel 3.
C	RF Mixer Grid & Osc.	0Ω		94D 46-74		Channel 4.
D	RF Mixer Grid & Osc.	0Ω		94D 46-75		Channel 5.
E	RF Mixer Grid & Osc.	0Ω		94D 46-76		Channel 6.
F	RF Mixer Grid & Osc.	0Ω		94D 46-77		Channel 7.
G	RF Mixer Grid & Osc.	0Ω		94D 46-78		Channel 8
H	RF Mixer Grid & Osc.	0Ω		94D 46-79		Channel 9.
I	RF Mixer Grid & Osc.	0Ω		94D 46-80		Channel 10.
J	RF Mixer Grid & Osc.	0Ω		94D 46-81		Channel 11.
K	RF Mixer Grid & Osc.	0Ω		94D 46-82		Channel 12.
L	RF Mixer Grid & Osc.	0Ω		94D 46-83		Channel 13.
L5	Fil. Choke	0Ω		98A 45-14		
L6	Fil. Choke	0Ω		73A 2-5	6175	
L7	RF Choke	0Ω		94D 46-86		
L8	Conv. Plate	.4Ω		98A 45-77		
L9	27.25 & 19.75 MC Trap Assy.			94D 47-56		Includes Band Pass Coupling Coil and .001MFD Capacitor
L10	1st Video IF	.2Ω		72B 106		
L11	Fil. Choke	0Ω		73A 2-5	6175	
L12	2nd Video IF	.4Ω	.4Ω	72C 96-14		
L13	21.25MC Trap	0Ω		72C 96-34	6171▲	Part No. Includes R29, C20 and C21.
L14	3rd Video IF	.4Ω	.4Ω	72C 96-16		Part No. Includes R32,
L15	4th Video IF	.2Ω		72B 105-1		Includes RF Choke, 120 and 6.8MMF Capacitor.
L16	Series Peaking Coil	5.2Ω		73A 5-15		Wound on 4.7KΩ Resistor.
L17	Shunt Peaking Coil	17Ω		73A 5-7	6174	500 Microhenries.
L18	4.5MC Trap	4.6Ω		72B 99-3	1470	Part No. Includes C27.
L19	Series Peaking Coil	7.5Ω		73A 5-14	6181▲	250 Microhenries; Wound on 18KΩ Resistor.
L20	Shunt Peaking Coil	22Ω		73A 11-1		Wound on 10KΩ Resistor.
L21	1st Sound IF	4.8Ω		72B 99-4	1470	
L22	RF Choke	8Ω		73A 5-2		Wound on 1Meg Resistor.
L23	2nd Sound IF	4.8Ω		72B 99-4	1470	
L24	Ratio Det.	3.6Ω	.2Ω CT	72B 68-2	1468	Tertiary Winding .9Ω.
L25	Horiz. Osc.	48Ω		94A 17	6210	Part No. Includes C64 and R83.
L26	Anti-Ringing Coil	3.4Ω		73B 8-2	4644	
L27	Loop Ant.	1.3Ω		69C 155-II		
L28	Osc. Coil	6.5Ω		69A 52-4	71-08C†	Tapped @ 5.8Ω.
L29	Input IF	17Ω	17.5Ω	72B 28-7	12-C1	
L30	Output IF	17Ω	17.5Ω	72B 28-7	12-C2	

▲ Enlarge mounting hole.
† Drill mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ADMIRAL PART No. FUSE	ADMIRAL PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	8AG	1/4A 250V	84A4-2	84A5-1	362.250 (8AG-1/4A)	387001	AGX 1/4	4520

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA ADMIRAL PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	REMARKS
M2	409A13	AC-AG-J	A-AG	W26B	A66U	33	0-2 or S-2	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THEIR RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PARTS LIST AND DESCRIPTIONS (Continued)

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

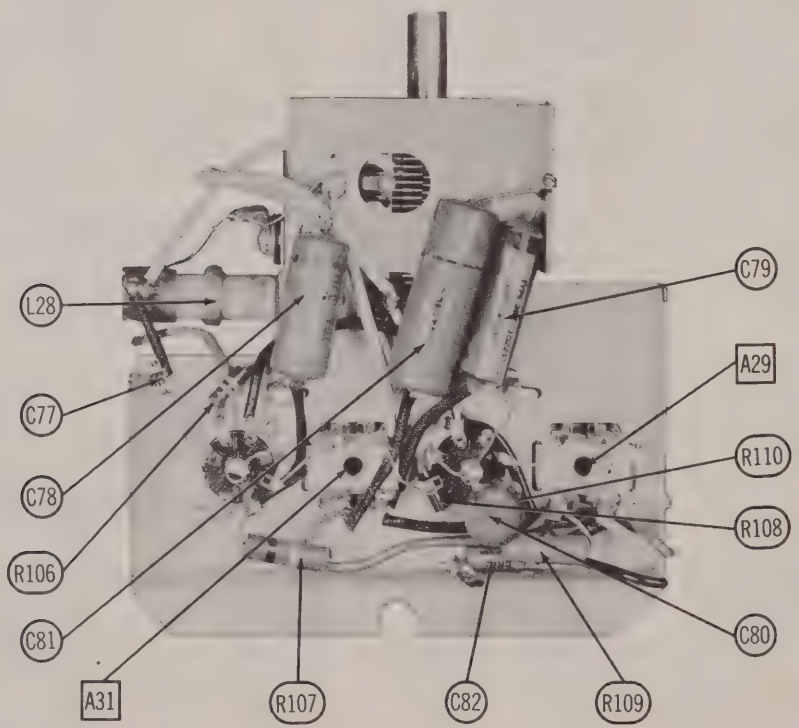
ITEM No.	REPLACEMENT DATA			REMARKS
	ADMIRAL PART No.	WALCO PART No.	JENSEN PART No.	
M3	98A15-19	W-30AGA or W-30AGS	JP-312 or JPS-312	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					ADMIRAL PART No.		
M4	Bayonet	6-8	.25	Blue	81A 1-5		Type No. 44.

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M5	RF Tuner	94D 47-2	
M6	Switch	77C 42	Function Selector, (Model 322DX16 only).
M7	Ion Trap	94A 15-2	
M8	Correction Magnet	A3614	(With Mounting Bracket)
M9A	Tuning Capacitor	68B 53	44-458MMF, 22-122MMF; Model 322DX16 (Early); Vert. Mount.
B	Tuning Capacitor	68B 53-1	44-458MMF, 22-122MMF; Model 322DX16 (Late); Horiz. Mount.
	Trimmer Cap.	66A 30-1	Horizontal Drive.
	Trimmer Cap.	66B 8-5	AM Antenna Loop. (Ch. 22E2)
	Cabinet	35E 225-1	Model 222DX15S.
	Cabinet	35E 225-2	Model 222DX16.
	Cabinet	35E 225-3	Model 222DX17.
	Cabinet	35E 226-2	Model 222DX26.
	Cabinet	35E 226-3	Model 222DX27.
	Cabinet	35E 236-1	Model 222DX48.
	Cabinet	35E 236-2	Model 222DX49.
	Cabinet	35E 233-2	Model 322DX16.
	Back	A3773	
	Panel	23D 133-1	Control (Less Door), Models 222DX15S, 222DX16, 222DX17, 222DX26 and 222DX27.
	Panel	15B 866-1	Control (Less Door), Models 222DX48 and 222DX49.
	Panel	23D 129-4	Control (Less Door), Model 322DX16.
	Door	23D 133-5	Panel, Models 222DX15S, 222DX16, 222DX17, 222DX26, 222DX27.
	Door	23D 130	Panel, Models 222DX48, 222DX49.
	Door	23D 129-5	Panel, Model 322DX16.
	Safety Glass	21B 64-2	
	Mask	23E 132	
	Knob	33C 53-2	Channel Selector,
	Knob	33D 88-21	Fine Tuning.
	Knob	33A 92-3	Vertical Hold, Focus (2 Used),
	Knob	33C 53-24	Off/On Volume, All Models Except 322DX16.
	Knob	33C 53-25	Off/On Volume, Model 322DX16.
	Knob	33D 88-19	Tuning (Radio), Model 322DX16.
	Knob	33B 90-4	Function Selector, Model 322DX16.
	Knob	33A 23-4	DX Range Finder



RADIO CHASSIS-BOTTOM VIEW

TROUBLE SHOOTING AIDS - CONT.

VIDEO

SOUND BARS

Check adjustment of A13 (4.5MC Trap) Check setting of local oscillator and alignemnt of IF stages.

POOR RESOLUTION

Check alignment of tuner and IF stages. Substitute V7 and check associated components.

POOR CONTRAST

Check waveform W2:

If Distorted or Weak	If Satisfactory
Substitute V4 and V7. Check circuit components.	Check picture tube.

SMEAR

Substitute V7 and check circuit components , particularly peaking coils.

ONE WIDE BLACK BAR ACROSS PICTURE

Check by substitution tuner, IF, and video amplifier tubes for leakage between filament and cathode.

AUDIO

WEAK OR NO SOUND

Check by substitution V6, V9, V10, V11 and V12. Check circuit components. Check alignment of sound and video IF stages.

BUZZ

Adjust discriminator secondary for minimum buzz. Substitute V10. Check local oscillator setting. Check for overload at waveform W2. If over - loading exists, check AGC network .

DISTORTED

Check audio stages using audio signal generator and scope:

If Undistorted	If Distorted
Check alignment of sound IF and discriminator.	Substitute V11 and V12. Check associated components.

POWER

SMALL RASTER

Substitute V21, Check filter components. Check B plus circuit. for short.

DIM PICTURE

Substitute V21 and check B plus components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse in high voltage compartment.

Check waveform W14:

If Unsatisfactory	If Satisfactory
Substitute V17, Check associated components.	Substitute V18, V19 and V20. Check T3 and associated components.

BLOOMING

If substituting of V17, V18, V20 and V21 does not correct the trouble, follow procedure outlined under loss of high voltage. Check R98 for increase in resistance.

GENERAL

NO SOUND, NO PICTURE, NO SNOW

Substitute V1, V2, V3, V5, V6 and V7. Check associated components. Check alignment of tuner.

SNOW BUT NO PICTURE OR SOUND

Check by substitution V1 and V2. Check tuner components.

WEAK PICTURE, GOOD SOUND (IN STRONG SIGNAL AREAS)

Check video IF tubes and components.

INTERMITTENT STREAKS

Check high voltage circuit for corona leakage and arcing.

The Trouble-Shooting photographs shown above are made with permission of the transmitting station WFBM-TV and in no way reflect the quality of the transmitted picture. Similarly, symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at time, through the small hole in the cabinet to the right of the channel selector shaft.

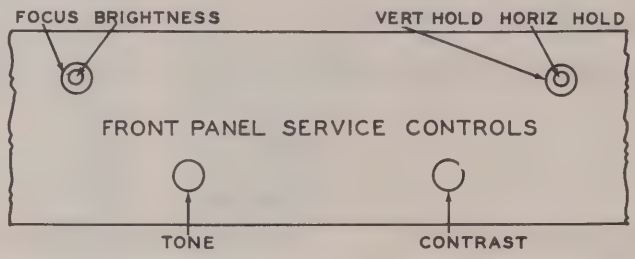
PICTURE TUBE SAFETY GLASS CLEANING

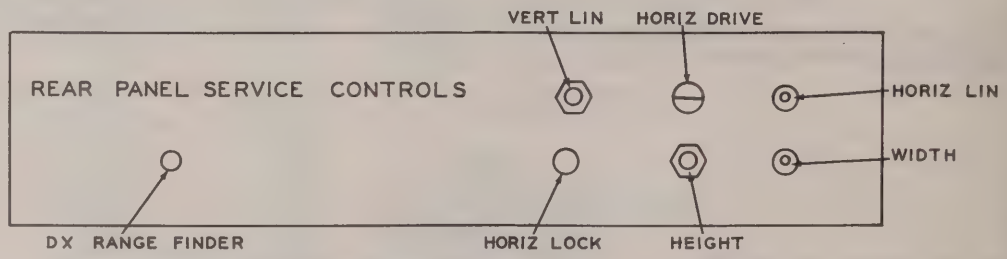
To clean safety glass remove 4 wood screws holding wood strip at top of cabinet. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





SPECIAL ADJUSTMENTS - DX RANGE FINDER ADJUSTMENT

Turn range finder control fully counter clockwise.

Tune in the strongest available TV signal.

Turn the contrast control fully clockwise.

Adjust DX Range Finder Control slowly clockwise for best contrast with no overloading or instability of picture.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the horiz. hold control at the mid-position of its range and adjust the Horiz. Lock slug until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector buzz, adjust the Ratio Detector Secondary, L24, located on top of chassis. (See tube placement chart). By inserting a proper hex alignment tool through top slug far enough to engage bottom slug.

FUSES

One fuse is used for Horiz. Sweep Circuit protection. (For location see tube placement chart).

CENTERING

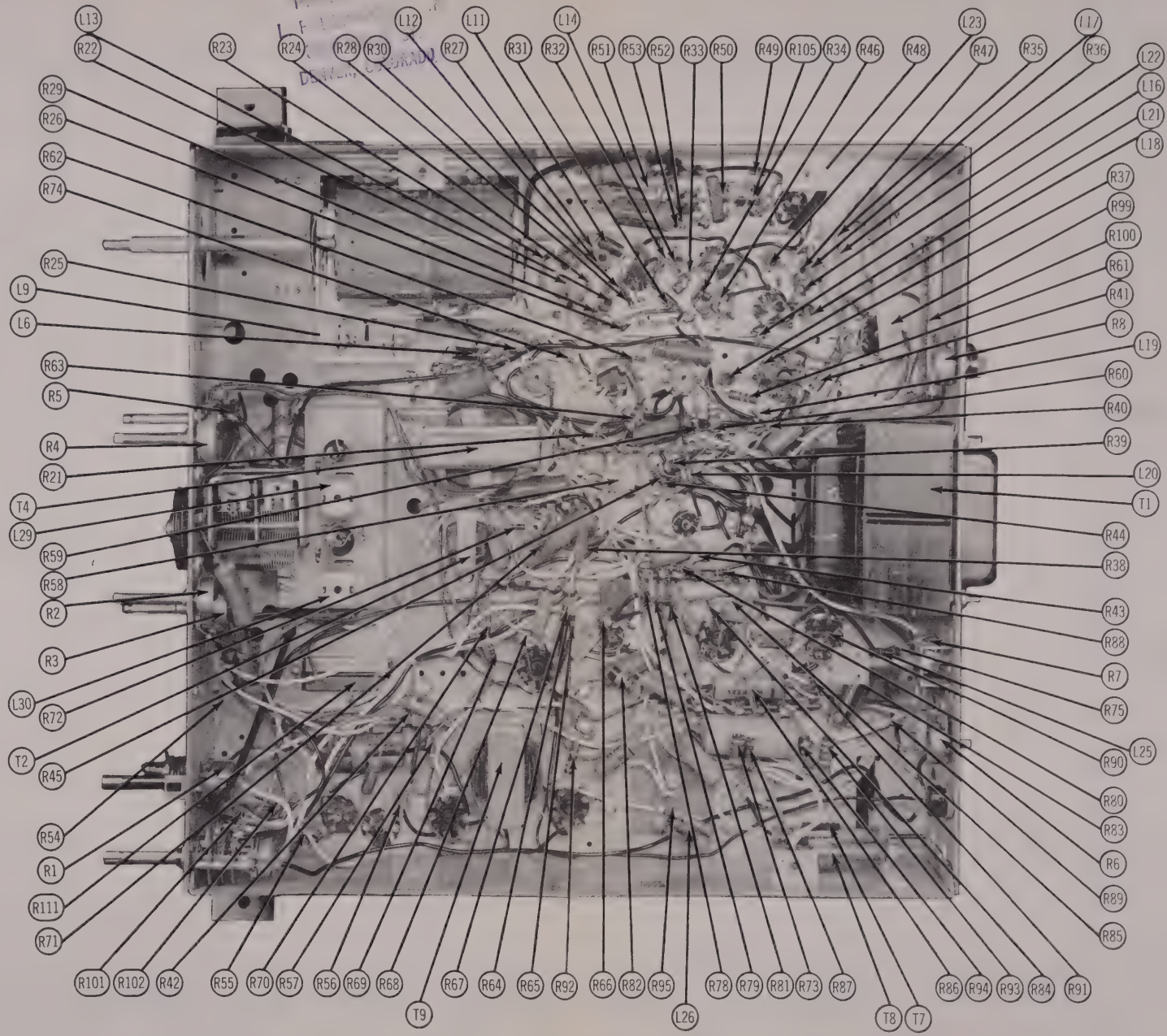
Centering is accomplished mechanically by menas of a centering lever on the EM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

ANTI-PIN CUSHION CORRECTION - CURVATURE CORRECTION MAGNETS

If either side of the picture has a pin cushion or curved effect loosen the mounting screws of the magnet on that side of the picture tube and position the magnet to correct the curvature.

DISASSEMBLY INSTRUCTIONS

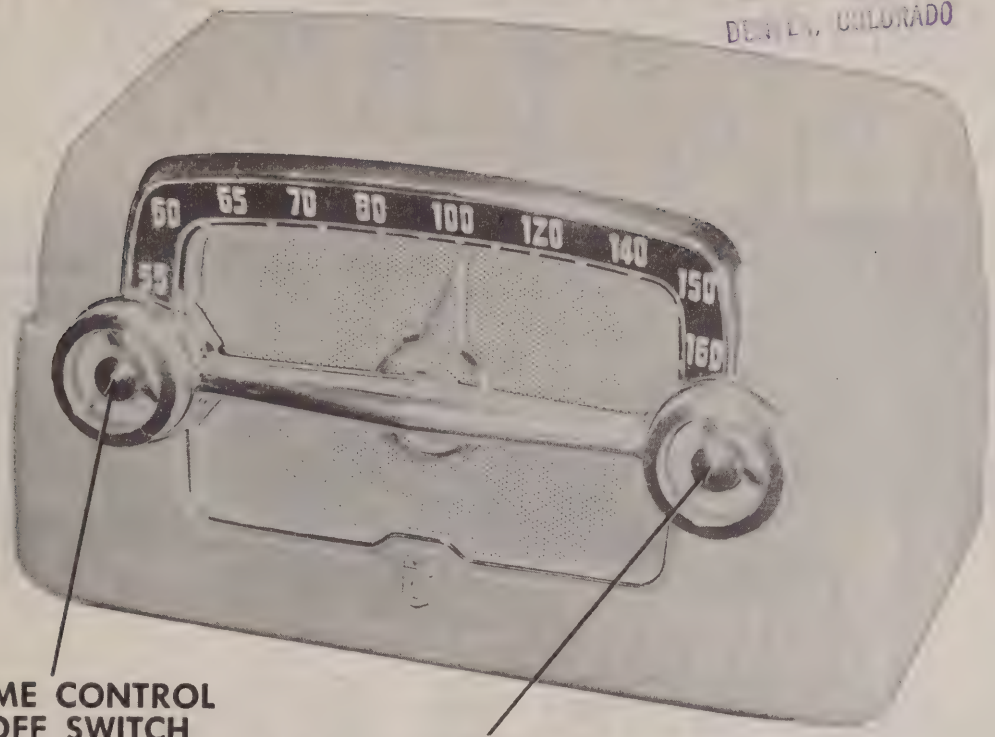
1. Remove 7 push on type control knobs from front panel.
2. Remove 7 wood screws and 2 metal screws. Remove rear cover.
3. Disconnect built-in antenna, also, disconnect leads from chassis.
4. Disconnect speaker, phono motor and audio (phono) plug.
5. Remove jewel lite from inside bottom front of cabinet.
6. Remove 4 chassis bolts. Remove chassis.
7. Remove 4 speaker nuts. Remove speaker.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

DE[illegible], COLORADO

CROSLEY MODELS E15BE, CE, SL, TN, WE, E20GN, GY, MN, TN (Ch. 15-20E)



CROSLEY MODELS E15BE, CE, SL, TN, WE, E20GN, GY, MN, TN (Ch. 15-20E)

CROSLEY MODEL E15TN

TRADE NAME	Crosley Models E15BE, CE, SL, TN, WE, E20GN, GY, MN, TN (Ch. 15-20E).
MANUFACTURER	Crosley Corp., 1329 Arlington St., Cincinnati, Ohio
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier.
POWER SUPPLY	105-125 Volts AC-DC — RATING .22 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	200MMF	High side to external antenna screw. Low side to outer terminal of phono jack.	455KC (400~Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1620KC	"	"	A5	"
3.	"	"	1400KC	Tune to 1400KC signal.	"	A6	"

Replace receiver in cabinet. Tune to station of known frequency near high frequency end of dial and set pointer to connect point on dial.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1953 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CROSLEY PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	100	150	147174	PRS150/80-40-20		C010 BR1015			R1307	Red
B	30	150								Blue
C	10	150								Green
C2	39		137727-109	SI39	D6-390		GP1K-390	UC-5439	5GA-Q39	
C3	.08	200	39001-85							
C4	.08	200	39001-85							
C5A	220		144675-1	SI220	D6-221	5W5T25	GP2K-221	UC-5322		
B	2000			BPD-002	DD-202	TM5D2	801-002	DC-522	34C3	
C	5000			BPD-005	DD-502	TM5D5	811-005	DC-525		
D	220			SI220	D6-221	5W5T25	GP2K-221	UC-5322		
C6	.002	600	39001-74	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	Note 1
C7	100		143686-3	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C8	500		†142951-12	SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C9	5000		‡142951-11	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C10	.01	400	39001-13	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C11	.05	400	39001-17	P-488-05		PTE4S5		PT415	4TM-S5	
C12	.08	200	39001-85							

Note 1. C6 and R15 are used with PM speakers only.
† Items C8 and R7 are combined in one unit.
‡ Items C9 and R8 are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CROSLEY PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	3 Meg	½	B-151845-C					Volume & Switch-Tap ⓐ 300KΩ

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	22KΩ	½	39374-41	BTS-22K	
R3	2.2Meg	½	39374-69	BTS-2.2Meg	
R4	100KΩ	½	39374-49	BTS-100K	
R5	10 Meg	½	39374-85	BTS-10 Meg	
R6	470KΩ	½	39374-57	BTS-470K	
R7	680KΩ	½	†142951-12	BTS-680K	
R8	47KΩ	½	‡142951-11	BTS-47K	
R9	1000Ω	½	39374-25	BTS-1000	

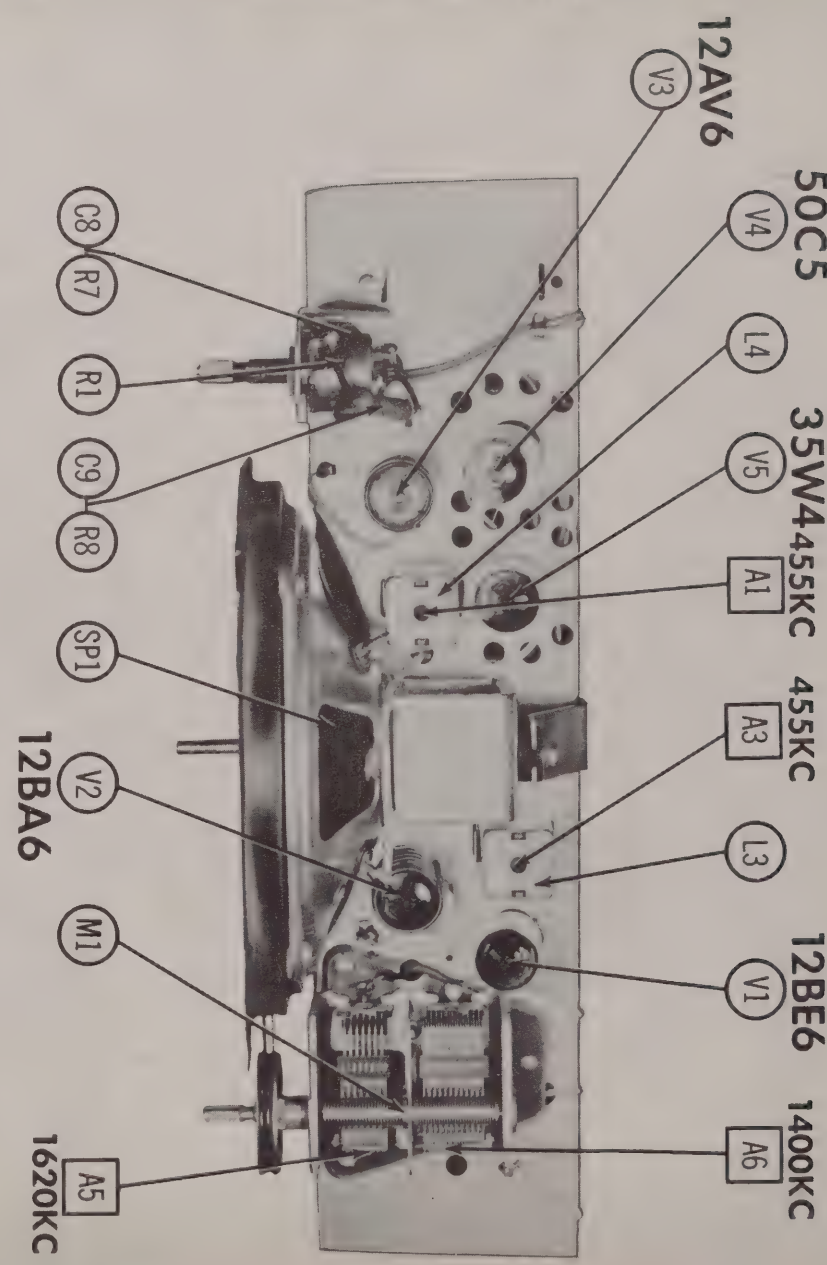
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R10	470KΩ	½	39374-57	BTS-470K	
R11	150Ω	½	39374-15	BTS-150	
R12	100Ω	2	39374-189		
R13	1200Ω	1	39374-114	BTA-1200	
R14	10Ω	½	39374-1		
R15	5600Ω	½	39374-34	BTS-5600	Note

Note . Used only with PM speaker.
† Items R7 and C8 are combined in one unit.
‡ Items R8 and C9 are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: CROSLEY PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	2.8	3.9Ω	370Ω	.8Ω	147171	A-3876	A-3025 ①	RO-302	S-1X	① Drill one new mtg. hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CROSLEY PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3.9Ω	145956-2	ST-830 Mod.P525-V	52A1	

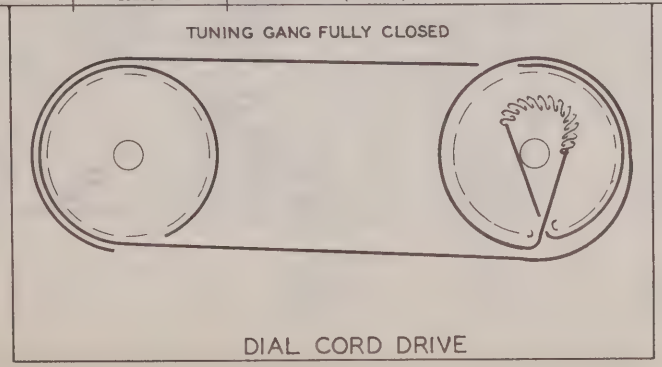
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	CROSLEY PART No.	MILLER PART No.	
L1	Loop Ant.	.1Ω	3.4Ω	153571*		Includes cabinet back; Used in models E15WE, E15BE, E15TN, E15SL, E15CE only.
L2	Osc. Coil	.9Ω	9.5Ω	153405	71-Osc.†	
L3	Input IF	14.5Ω	14.5Ω	139919-3	12-C1	
L4	Output IF	14.5Ω	14.5Ω	139919-3	12-C2	

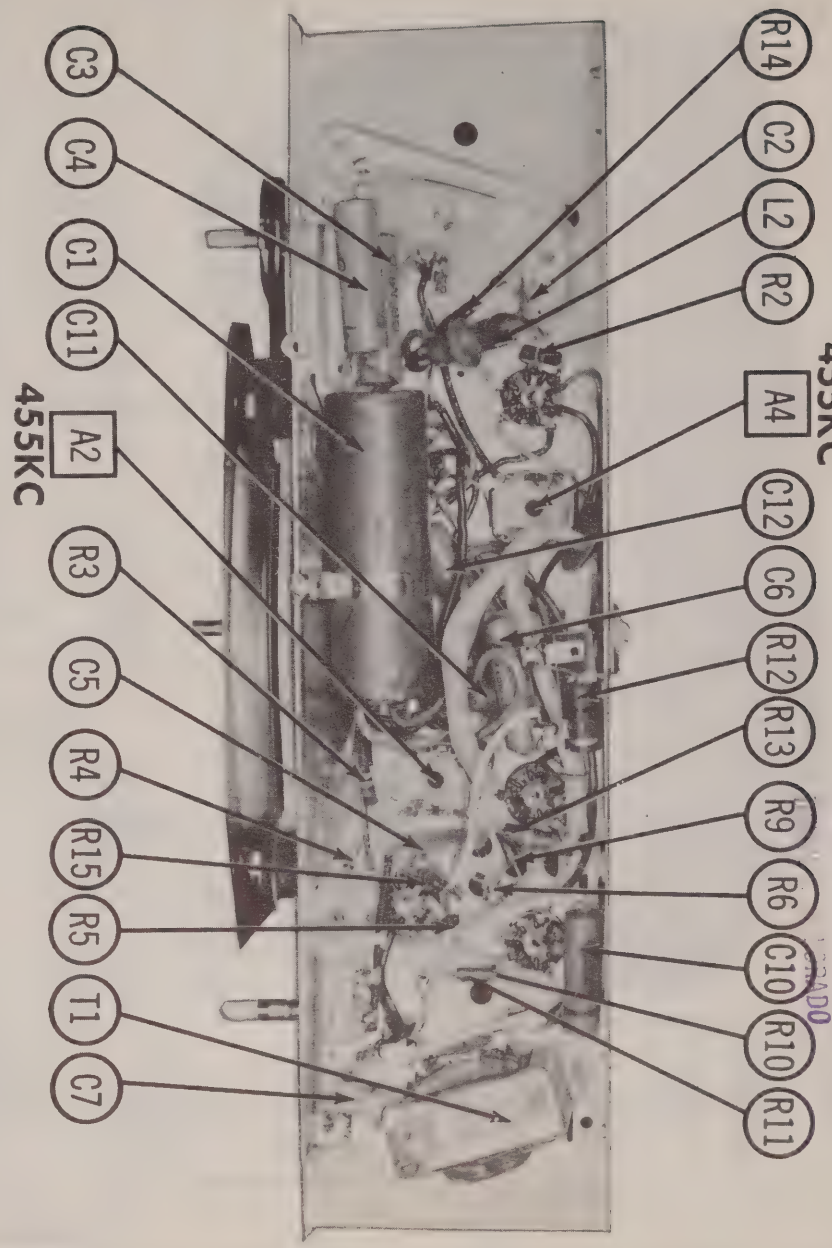
* Models E20MN, E20GN, E20GY & E20TN use part No. 152994 in this application.
† Drill mtg. hole.

MISCELLANEOUS

ITEM No.	PART NAME	CROSLEY PART No.	NOTES
M1	Tuning Capacitor	151844	24-370MMF, 16-105MMF
M2	Switch	148260	Radio - Phono Selector
	Cabinet	153567-2	Model E15BE (Blue)
	Cabinet	153567-5	Model E15CE (Chartreuse)
	Cabinet	153567-4	Model E15SL (Steel Blue)
	Cabinet	153567-3	Model E15TN (Tan)
	Cabinet	153567-1	Model E15WE (White)
	Cabinet	153009-3	Model E20GN (Green)
	Cabinet	153008-4	Model E20GY (Grey)
	Cabinet	153007	Model E20MN (Maroon)
	Cabinet	153008-2	Model E20TN (Tan)
	Escutcheon	153291-2	Models E15BE, E15SL, E15TN
	Escutcheon	153291-1	Model E15WE
	Escutcheon	151674-3	Model E20GN
	Escutcheon	151674-4	Model E20GY
	Escutcheon	151674-1	Model E20MN
	Escutcheon	151674-2	Model E20TN
	Pointer	153380-2	Models E15BE, E15CE, E15SL, E15TN
	Pointer	153380-1	Model E15WE
	Pointer	151854	Models E20GN, E20GY, E20MN, E20TN
	Knob	153552-2	Model E15BE (2 Used)
	Knob	153552-5	Model E15CE (2 Used)
	Knob	153552-4	Model E15SL (2 Used)
	Knob	153552-3	Model E15TN (2 Used)
	Knob	153552-1	Model E15WE (2 Used)
	Knob	152996-3	Model E20GN (2 Used)
	Knob	152996-4	Model E20GY (2 Used)
	Knob	152996-1	Model E20MN (2 Used)
	Knob	152996-2	Model E20TN (2 Used)



CHASSIS—BOTTOM VIEW



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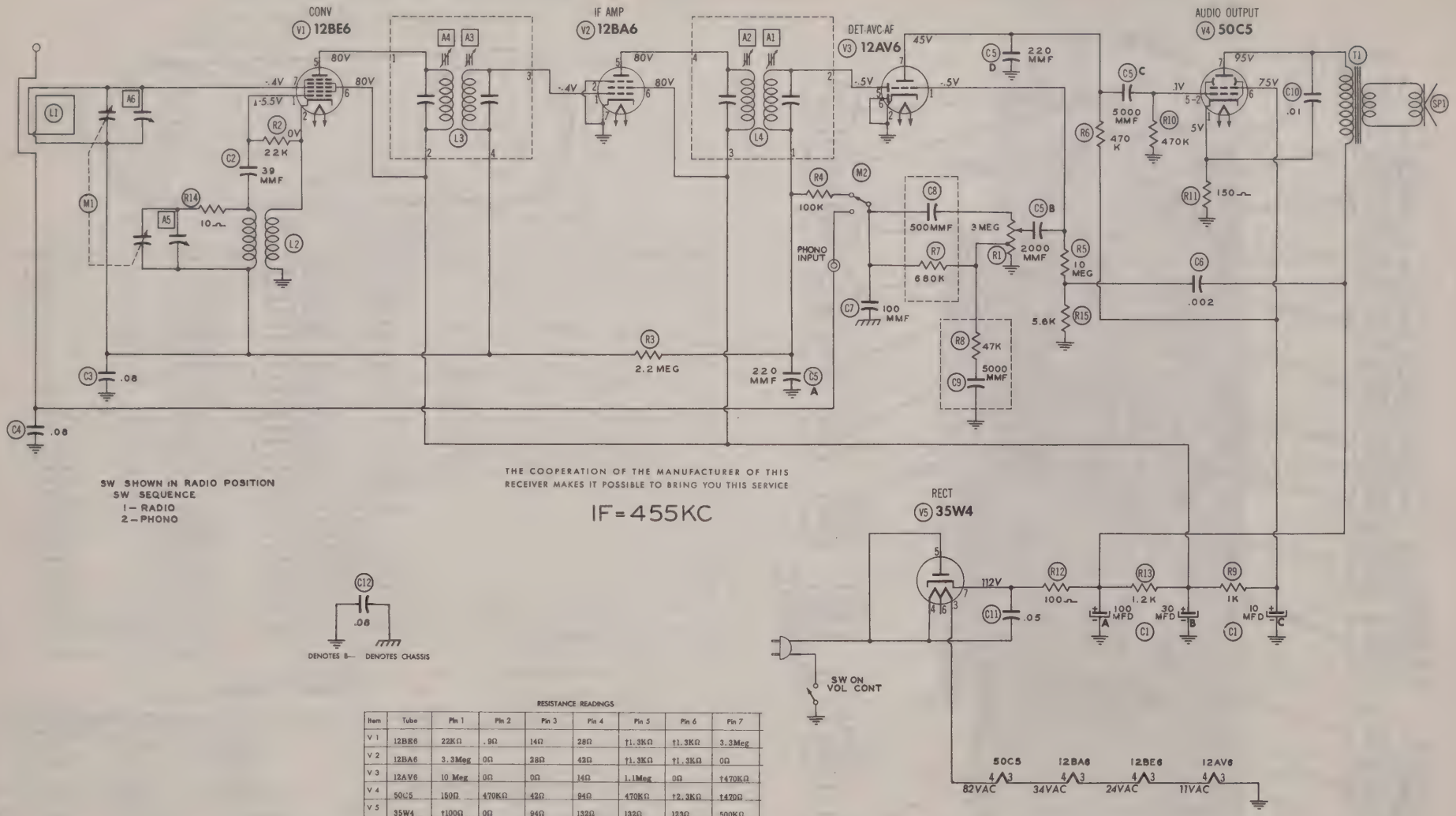
CROSLEY MODEL E15BE (Ch. 15-20E)



SW SHOWN IN RADIO POSITION
SW SEQUENCE
1 – RADIO
2 – PHONO

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF = 455KC

C12 .08
DENOTES B— DENOTES CHASSIS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.9Ω	14Ω	28Ω	†1.3KΩ	†1.3KΩ	3.3Meg
V 2	12BA6	3.3Meg	0Ω	28Ω	42Ω	†1.3KΩ	†1.3KΩ	0Ω
V 3	12AV6	10 Meg	0Ω	0Ω	14Ω	1.1Meg	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	42Ω	94Ω	470KΩ	†2.3KΩ	†470Ω
V 5	35W4	†100Ω	0Ω	94Ω	132Ω	132Ω	123Ω	500KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V5

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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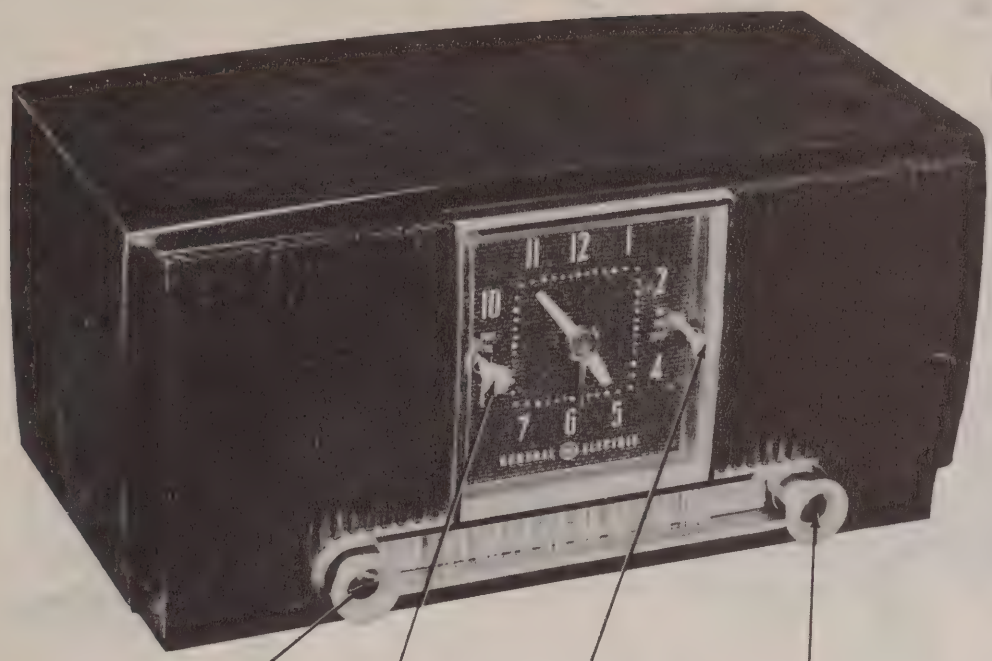
201-3

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

GENERAL ELECTRIC
MODELS 551, 552



GENERAL ELECTRIC
MODELS 551, 552

GENERAL ELECTRIC MODEL 551

TRADE NAME	General Electric Models 551, 552.
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, New York.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock.
TUBES (Six)	Types: 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 35C5 Audio Output, 35W4 Rectifier.
POWER SUPPLY	105 - 120 Volts AC - 60 Cycle
TUNING RANGE—BROADCAST	540-1610 KC RATING .26 Amp. @ 117 Volts

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available, If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Turn tuning gang fully closed and set pointer one inch from edge of volume control.
When chassis is mounted in cabinet the pointer should then coincide with the index mark at the left end of dial plate.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	455KC	Tuning gang fully open.	Across voice coil.	A1, A2 A3, A4.	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop.	1610KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	Tune to 1500KC signal.	"	A6, A7	"
4.		"	600KC	Tune to 600KC signal.	"	A8	Adjust for maximum output while rocking tuning gang then readjust A6 as in step 3.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: General Electric PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	RF Amplifier	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amplifier	12BA6	12BA6	7BK	
V4	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V5	Audio Output	35C5	35C5	7CV	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	RCE-149	PRS150/50-50		BBRD 5515		2N521	TVA-2453	Red
B	50	150								Yellow
C2	100		RCW-3079							
C3	2.7		RCW-3039							
C4	.05	400	UCC-045	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C5	47		RCW-3075	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C6A	.0035		RCW-3036							
B	220									
C	.005									
C7	.02	400	UCC-041	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C8	.047	600	RCN-053	689ZX-05		PJ6S47		PT6147	6TM-S47	
C9	.05	400	UCC-045	P488-05		PTE4S5		PT415	4TM-S5	
C10	.03	600		P688-03		PTE6S3		PT613	6TM-S3	Note 1.

Note 1: Some models use .02 MFD in this application (Part No. UCC-041).

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: General Electric PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	RRC-199	Q19-137X	AT-112	ABT-71	UT-443	Volume - Tapped @ 500KΩ.
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: General Electric PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	22KΩ	½	URD-081	BTS-22K	
R3	22Ω	½	URD-021		Note 1.
R4	100Ω	½		BTS-100	
R5	2.7Meg	½		BTS-2.7Meg	Note 2.
R6	33KΩ	½	URD-085	BTS-33K	
R7	6.8Meg	½	URD-141	BTS-6.8Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: General Electric PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R8	470KΩ	½	URD-113	BTS-470K	
R9	1Meg	½	URD-121	BTS-1Meg	
R10	150Ω	½	URD-029	BTS-150	
R11	1000Ω	2	URF-049	BTB-1000	
R12	18Ω	½	URD-007		

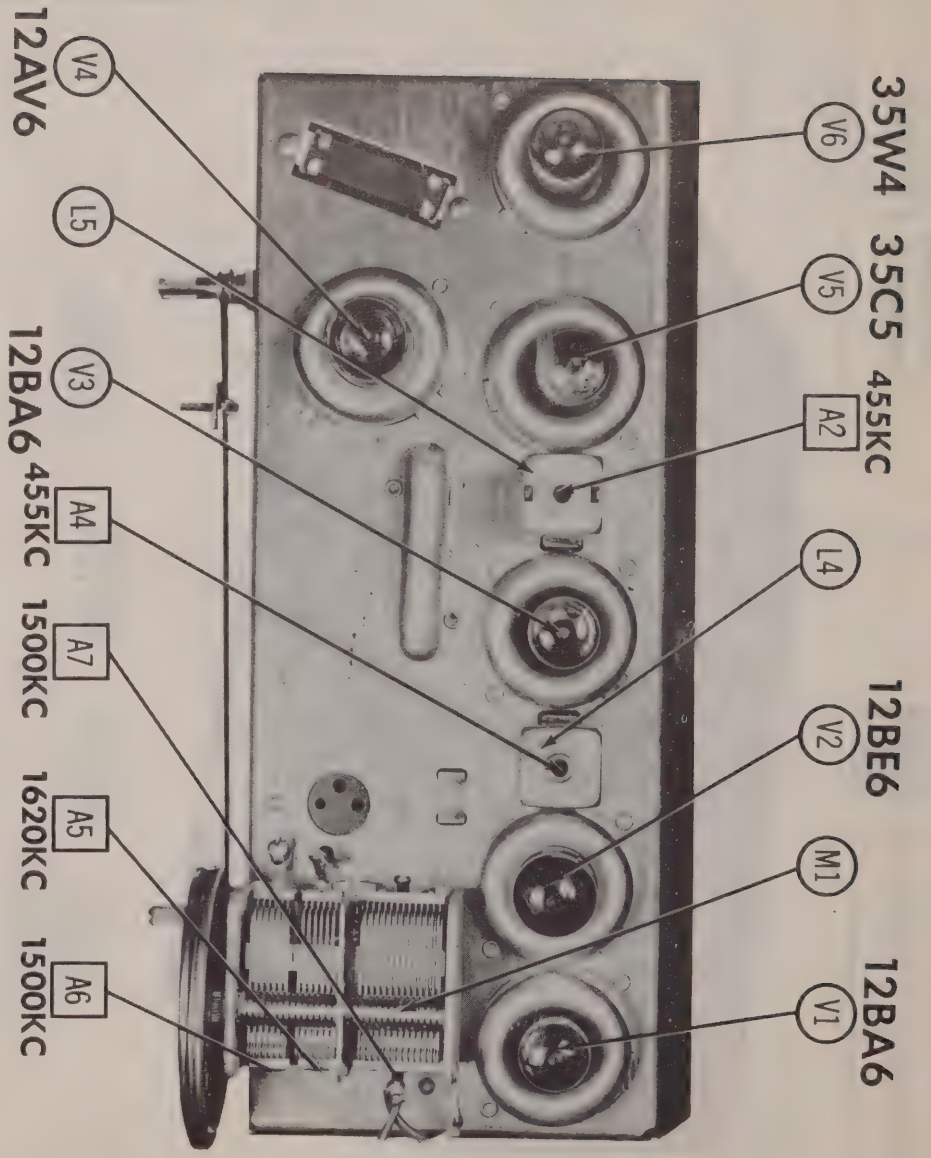
Note 1: Some models may use a 68Ω resistor in this application.
Note 2: Some models may use a 2.2Meg resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: General Electric PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	2.8KΩ	3.7Ω	250Ω tap @ 12Ω	.5Ω	RT0-100	A-3330 ①	A-3031 ①	R0-3 ①		

① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	General Electric PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.7Ω	S-400D4 S-400D7 ①	ST-113 Mod. P4-X	4A07	① Alternate speaker.

① Drill new mounting hole.

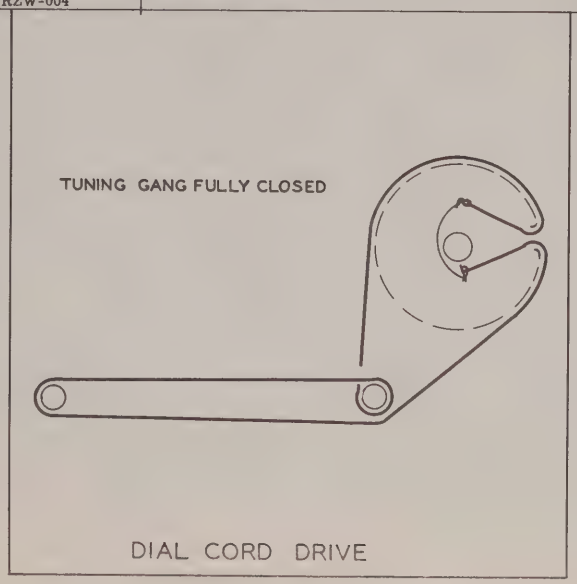
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	General Electric PART No.	MILLER PART No.	
L1	Loop Ant.	0Ω	3Ω	RAB-195		Includes Cabinet Back.
L2	RF Coil	47Ω	10.5Ω	RLB-034		Sec. tapped @ 5.5Ω.
L3	Osc. Coil	.4Ω	7.5Ω	RLC-121	71-0SC*	
L4	Input IF	13.5Ω	13Ω	RTL-135	12-C1	
L5	Output IF	16.5Ω	16Ω	RTL-136	12-C6	

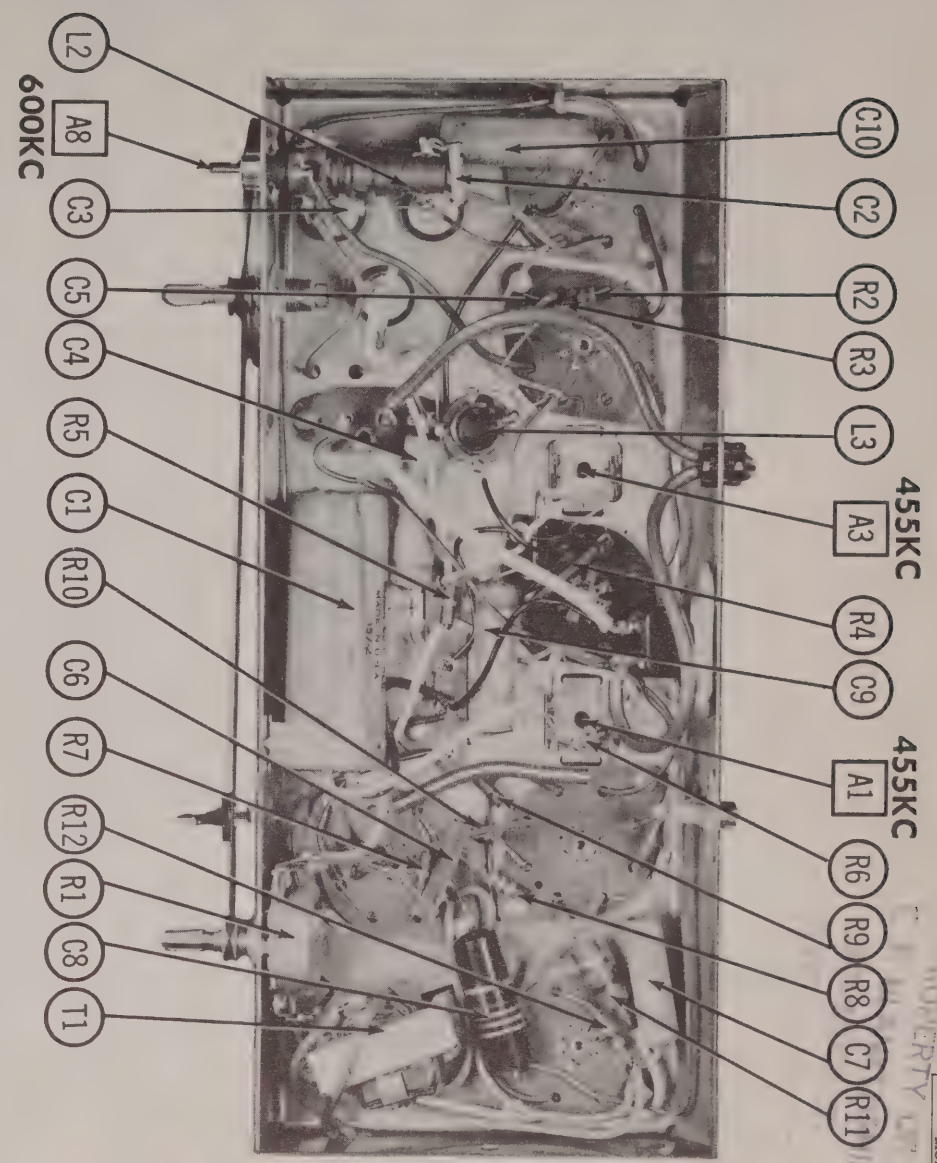
* Drill mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	General Electric PART No.	NOTES
M1	Tuning Capacitor	RCT-064	31-442MMF, 11-207MMF, 17-125MMF.
	Clock Assembly	RZC-024	Less knobs and crystal.
	Cabinet	RAU-369	Model 551.
	Cabinet	RAU-370	Model 552.
	Escutcheon	RDE-141	Clock and Radio Dial Scale Escutcheon.
	Pointer	RDP-074	Dial Scale Pointer and Slider
	Knob	RDK-297	On/Off Volume or Tuning Model 551 (2 Used).
	Knob	RDK-298	On/Off Volume or Tuning Model 552 (2 Used).
	Knob	RZK-008	Clock Control Model 551 (2 Used).
	Knob	RZK-001	Clock Control Model 552 (2 Used).
	Crystal	RZW-004	

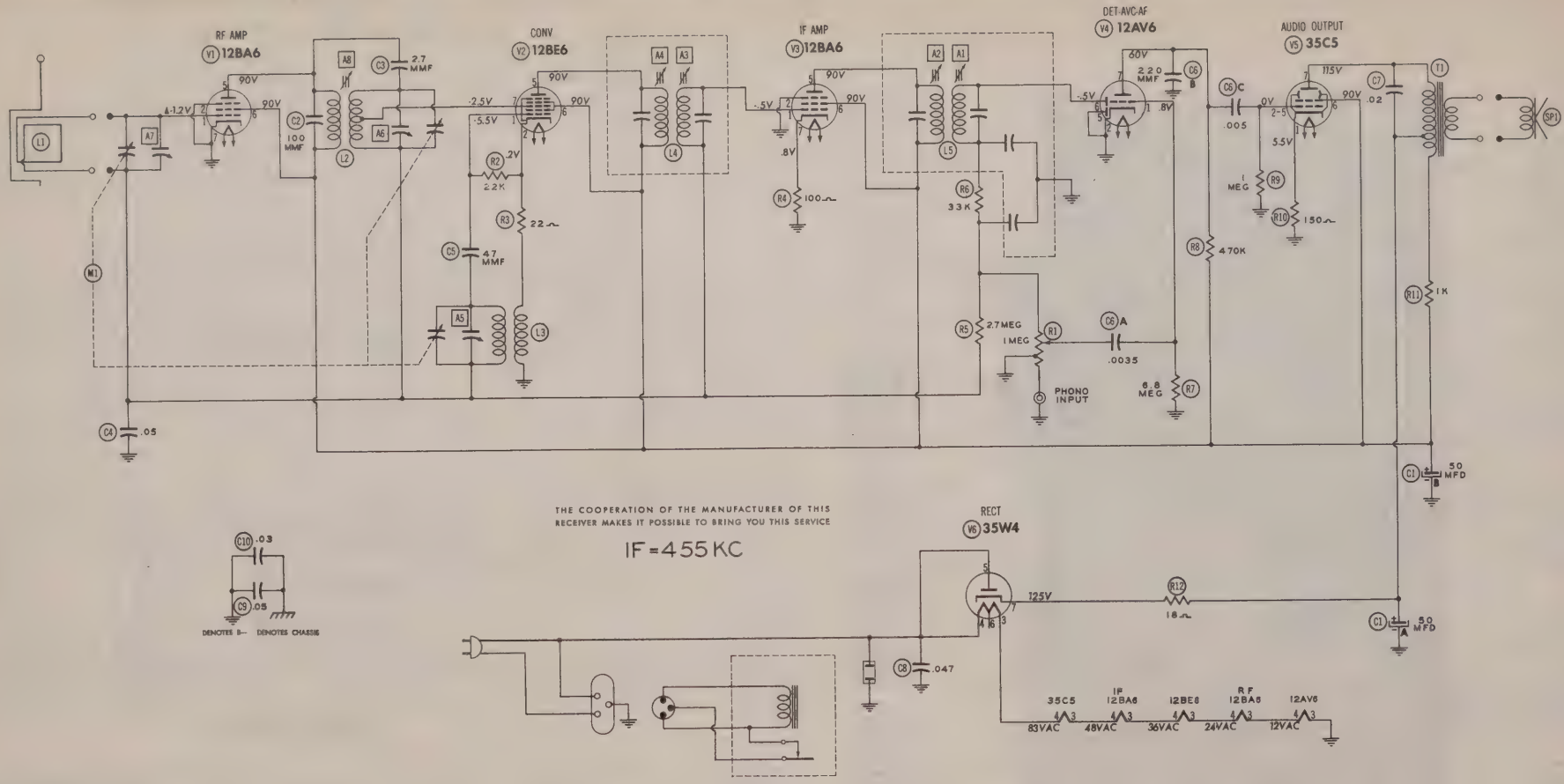


CHASSIS—BOTTOM VIEW



PROPERTY OF

GENERAL ELECTRIC
MODEL 551



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BA6	3.2Meg.	0Ω	12Ω	24Ω	† 1KΩ	† 1KΩ	0Ω
V 2	12BE6	22KΩ	22Ω	24Ω	36Ω	† 1KΩ	† 1KΩ	3.2Meg
V 3	12BA6	3.2Meg	0Ω	36Ω	48Ω	† 1KΩ	† 1KΩ	100Ω
V 4	12AV6	6.8 Meg	0Ω	0Ω.	12Ω	530KΩ	0Ω	† 470KΩ
V 5	35C5	150Ω	1Meg	48Ω	84Ω	150Ω	† 1KΩ	† 1.2KΩ
V 6	35W4	1KΩ	18Ω	84Ω	117Ω	84Ω	INF	500KΩ

† MEASURED TO PIN 7 OF V6.
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

*TRADE MARK

HOFFMAN MODELS 7B104, 7B303, 7M103, 7M302, 7P105, 7P304 (Ch. 190, B), 20B102F, 20M101F (Ch. 194), 21B107, 21B301, 21B504, 21B701 (Ch. 191, B), (Ch. 192), 21M106, 21M300, 21M503, 21M700 21B901 21M900 (Ch. 192), 21P108, 21P505, (Ch. 191, B), 21P702 (Ch. 191, B), 21P902 (Ch. 192)

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DATE 4-53 SET 201 FOLDER 5

HOFFMAN MODELS 7B104, 7B303, 7M103, 7M302, 7P105, 7P304 (Ch. 190, B), 20B102F, 20M101F (Ch. 194), 21B107, 21B301, 21B504, 21B701 (Ch. 191, B), 21B901 (Ch. 192), 21M106, 21M300, 21M503, 21M700 (Ch. 191, B), 21M900 (Ch. 192), 21P108, 21P505, 21P702 (Ch. 191, B), 21P902 (Ch. 192)

TRADE NAME	Hoffman	MODELS	CHASSIS
		7B104, 7B303, 7M103, 7M302, 7P105, 7P304	190, B
		20B102F, 20M101F,	194
		21B107, 21B301, 21B504, 21B701	191, B
		21B901	192
		21M106, 21M300, 21M503, 21M700	191, B
		21M900	192
		21P108, 21P505, 21P702	191, B
		21P902	192
MANUFACTURER	Hoffman Radio Corp., 3761 S. Hill St., Los Angeles, Calif.		
TYPE SET	Television Receiver		
TUBES	Twenty-Four		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING	2.08 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 25.5MC, Sound IF 21.0MC (Intercarrier).		

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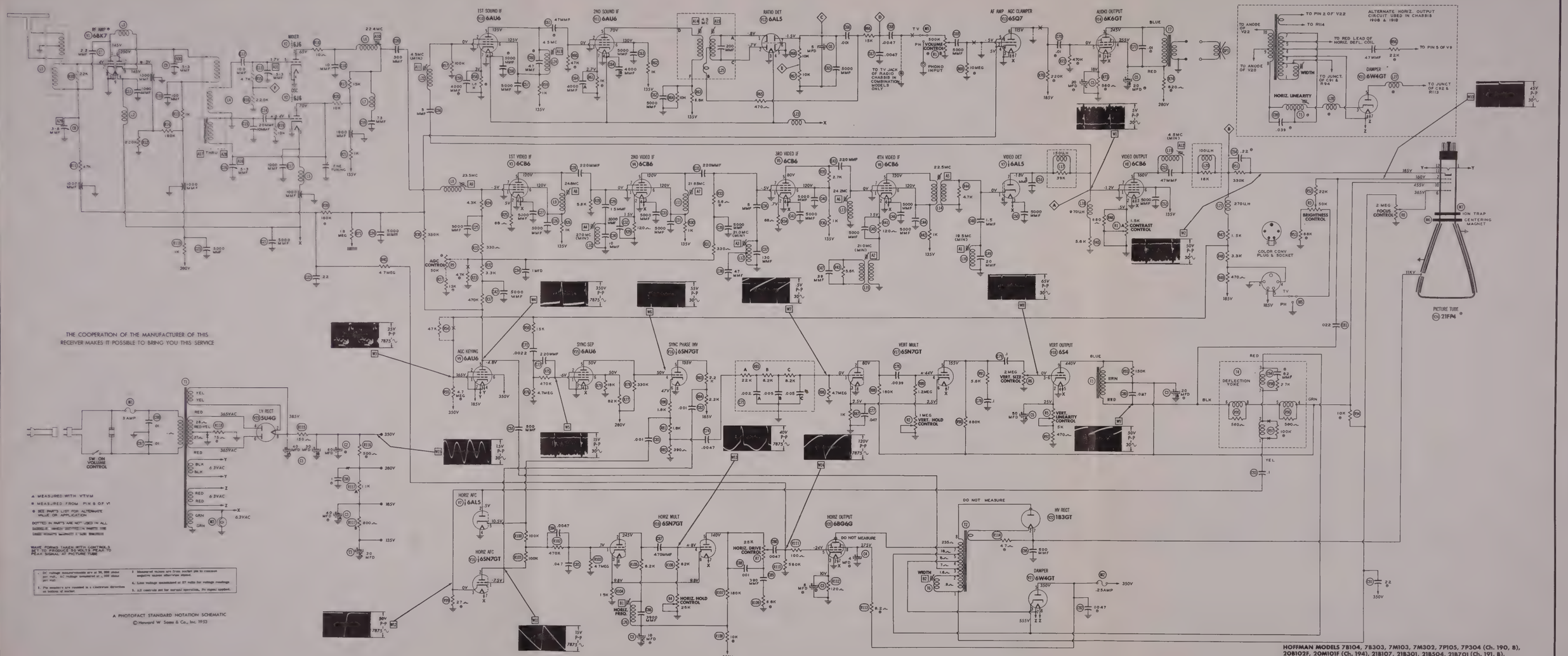
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A MEASURED WITH VTVM
B MEASURED FROM PIN 5 OF V1
C SEE PART'S LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PART'S ARE NOT USED IN ALL
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 10 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
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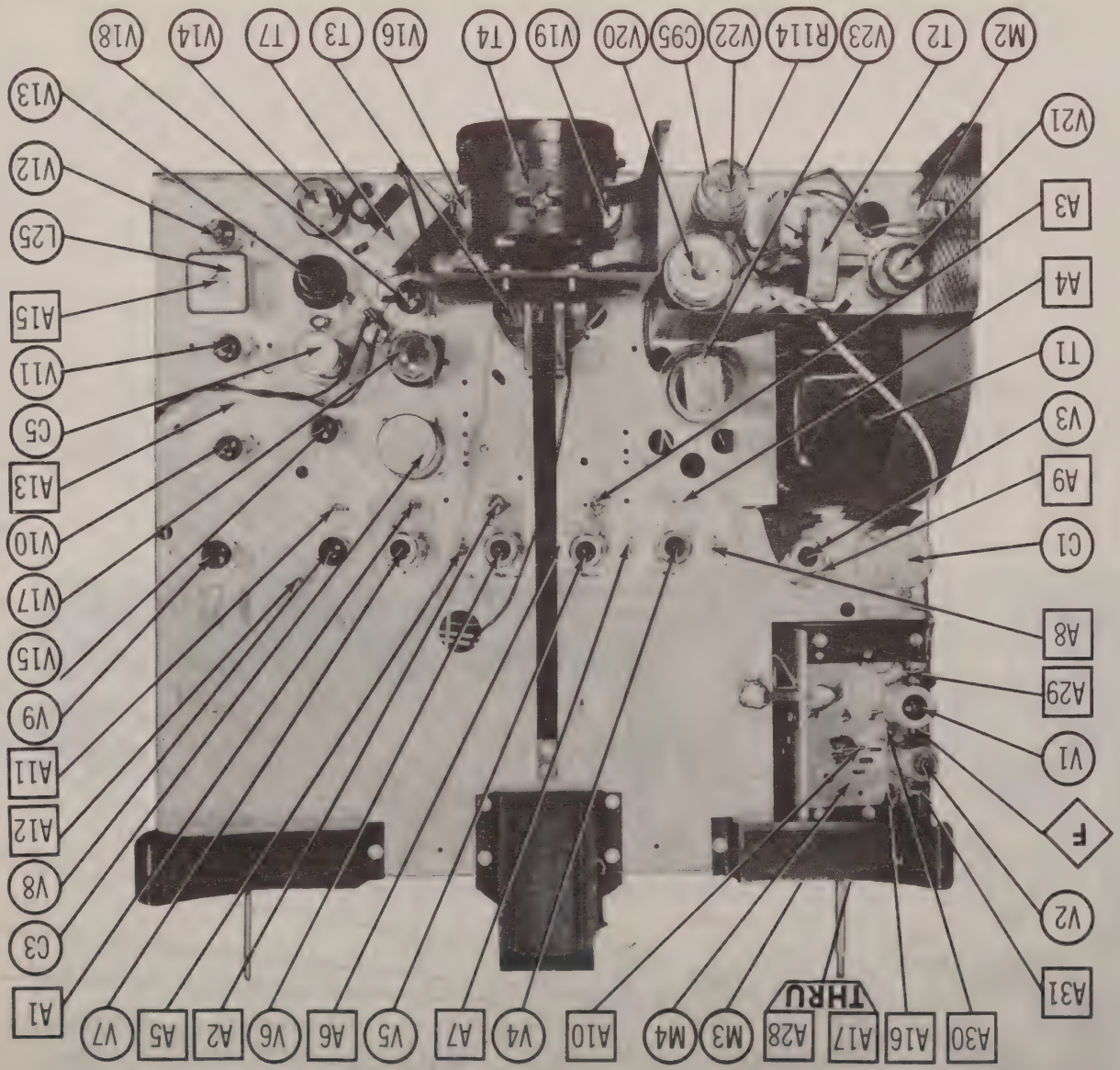
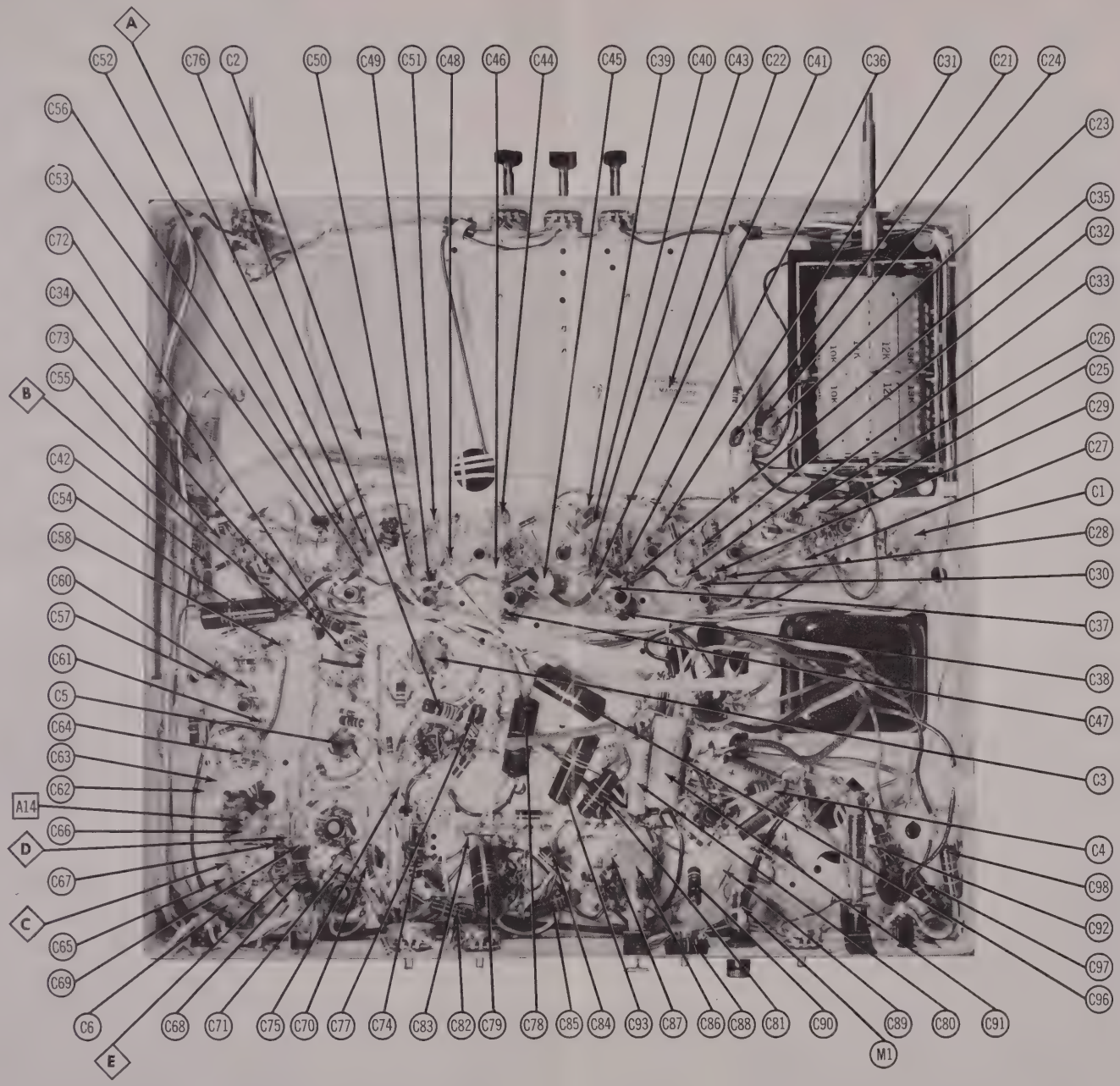
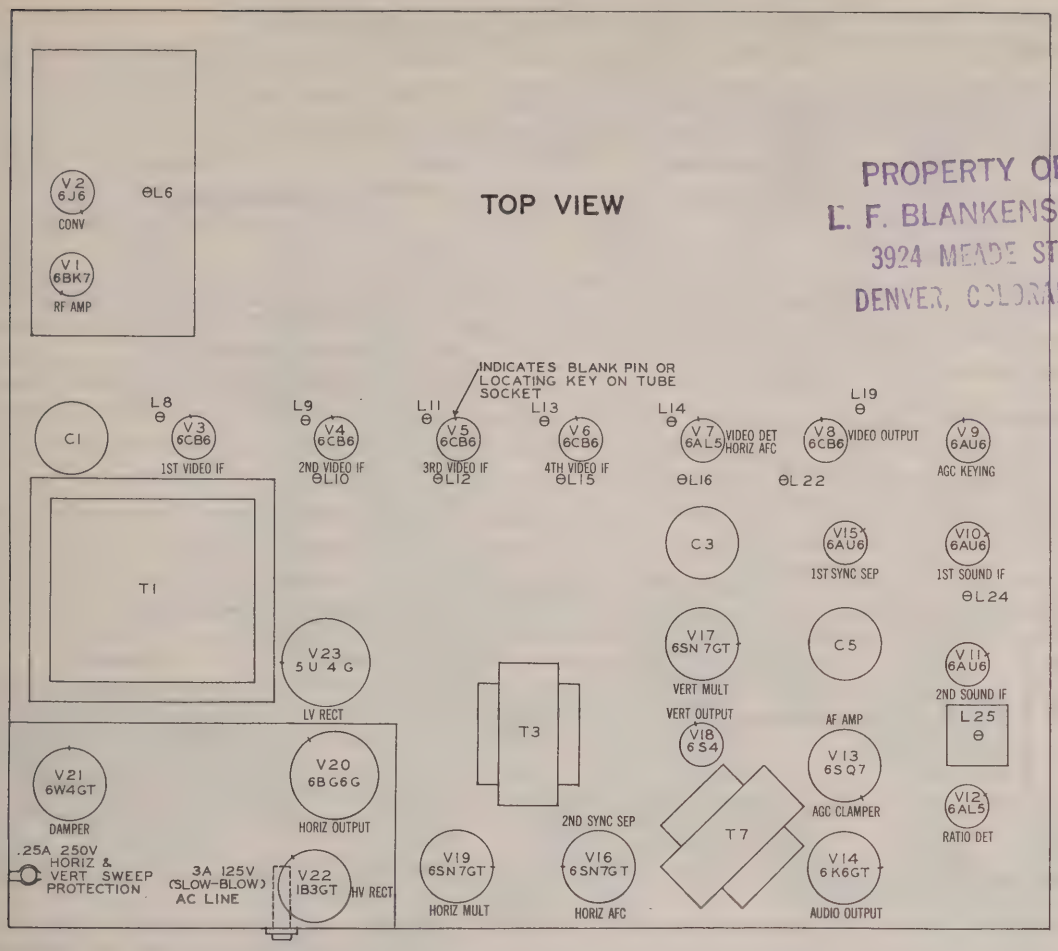
CHASSIS TOP VIEW





CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



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DENVER, COLORADO

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound-V23 Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6, V7
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V8, V24
Has pic, no sound-V10, V11, V12, V13, V14
Overloaded picture-V9, V13

SYNC FAILURE
No vert. sync.-V16, V17
No horiz. sync.-V7, V16, V19
No vert. or horiz. sync.-V15, V16

SWEEP FAILURE
No raster, has sound-V19, V20, V21, V22, V24 Fuse (M2)
No vertical deflection-V17, V18
Poor vert. linearity or foldover-V17, 1V18
Poor horiz. linearity or foldover-V19, V20, V21
Narrow picture-V19, V20, V21, V22, V23
Vert. off freq.-V16, V17
Horiz. off freq.-V7, V16, V19

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal oscillator tube (V19).

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C34. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	19.5MC (Unmod)	Any	DC probe thru 10KΩ to point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	21.0MC	"	"	A2, A3	Adjust for MINIMUM deflection. When adjusting A3, detune A2 by placeing finger on coil.
3.	"	"	27.0MC	"	"	A4	Adjust for MINIMUM deflection.
4.	"	"	22.5MC	"	"	A5	Adjust for maximum deflection. Attenuate generator output to maintain 1 Volt at VTVM.
5.	"	"	24.2MC	"	"	A6	"
6.	"	"	21.85MC	"	"	A7	"
7.	"	"	24.8MC	"	"	A8	"
8.	"	"	23.5MC	"	"	A9	"
9.	"	"	22.4MC	"	"	A10	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Connect a .001MFD capacitor across the input terminals of the scope and 10KΩ in series with the hot lead to scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low Side to chassis.	23MC (10MC Swp)	19.5MC 21.0MC 22.4MC 24.4MC 25.5MC 27.0MC	Any	Vert. Amp. to point (A). Low side to chassis.		Check for response curve similar to Fig.1 within the limitations as shown. If necessary adjust A9 to correct any tilt and A10 for correct placement of 25.5MC video marker. Retouch A5, A6, A7 and A8 only if A9 and A10 fail to give desired response.

4.5MC TRAP AND SOUND TAKE-OFF ADJUSTMENTS

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.005MFD	High side to pin 7 (plate) of 6AL5 (V7A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru detector (Fig. 2) to point (B). Common to chassis.	A11	Detune A12 and adjust A11 for MINIMUM deflection.
12.	"	"	"	"	"	A12	Detune A11 by touching coil with finger while adjusting A12 for MINIMUM deflection.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	.005MFD	High side to pin 1 (grid) of 6AU6 (V10). Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru 10KΩ to point (C) Common to chassis.	A13, A14	Adjust for maximum deflection.
14.	"	"	"	"	DC probe thru 10KΩ to point (D). Common to point (E).	A15	Adjust for a zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	.005MFD	High side to pin 1 (grid) of 6AU6 (V10). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru 10KΩ to point (C). Low side to chassis.	A13, A14	Disconnect stabilizer capacitor C6. Adjust for curve of maximum amplitude and symmetry as in Fig. 3.
14.	"	"	"	"	"	Vert. Amp. to point (D). Low side to chassis.	A15	Reconnect capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

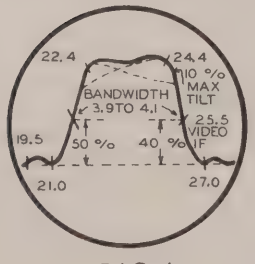


FIG. 1

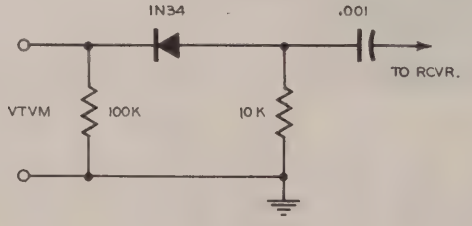


FIG. 2

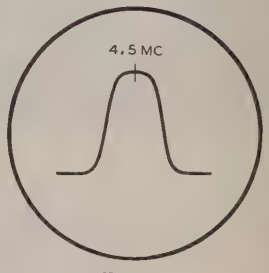


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them them in one step using A16. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A16 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for reach channel that is off frequency. The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A17	Adjust to place sound marker in sound trap notch as in Fig. 5. Video marker should be at 40%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A18	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A19	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A20	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A21	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A22	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A23	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A24	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A25	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A26	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A27	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A28	

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (F). Low side to chassis.	A29, A30 A31	Adjust for response similar to Fig. 6.
17.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 6. If markers fall below 70% on any channel make slight compromise adjustments of A29, A30 and A31 with channel switch set to that channel, then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

FIG. 4

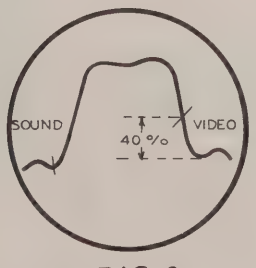


FIG. 5

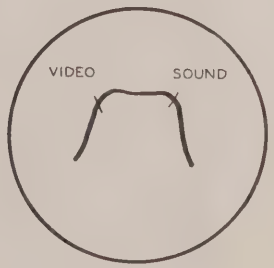
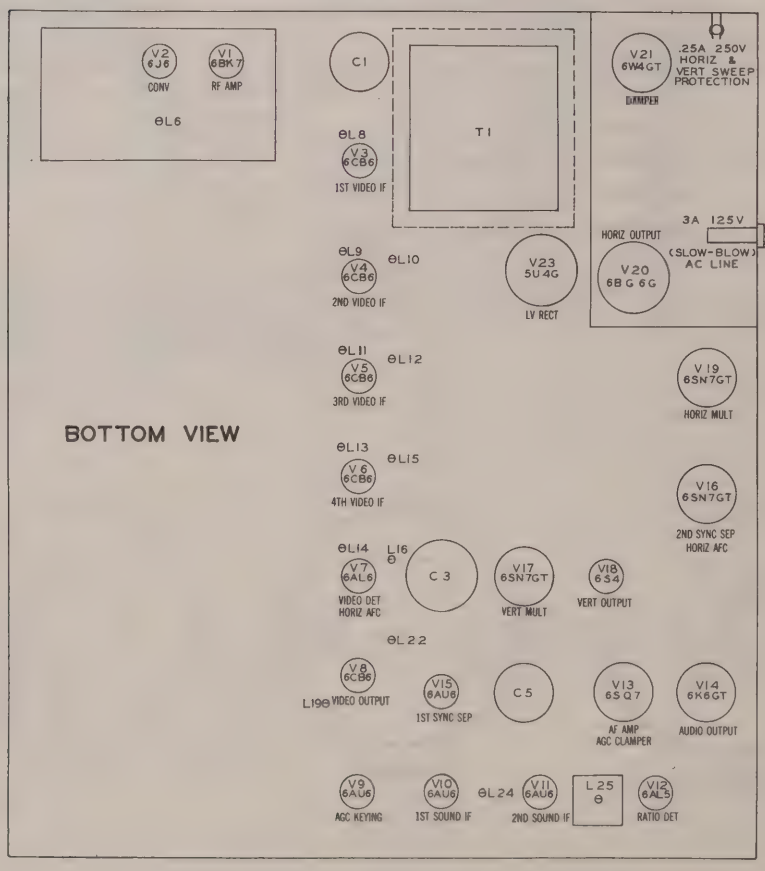


FIG. 6

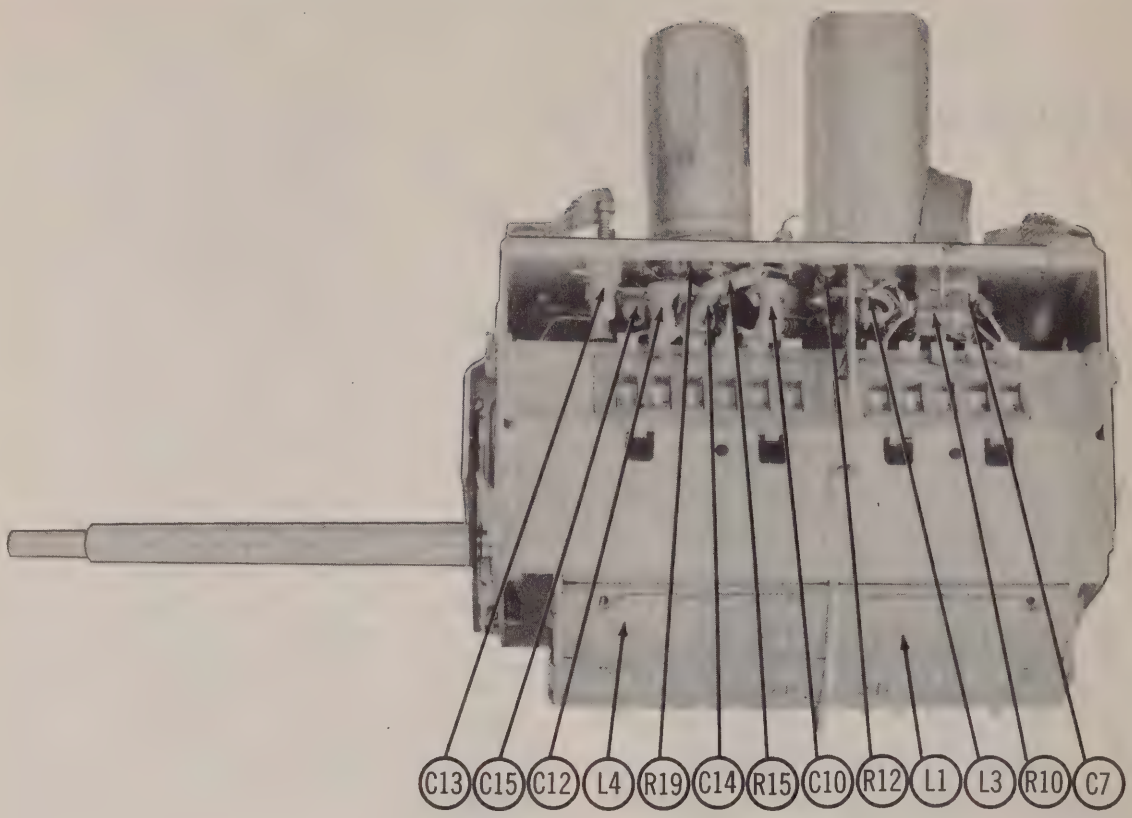
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	INF	700KΩ	0Ω	.1Ω	0Ω	†2.6KΩ	†115KΩ	INF	0Ω
V 2	6J6	†14KΩ	†18KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6CB6	50KΩ	68Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	0Ω		
V 4	6CB6	5.6KΩ	120Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	0Ω		
V 5	6CB6	53KΩ	68Ω	.1Ω	0Ω	†6.2KΩ	†3.5KΩ	0Ω		
V 6	6CB6	.2Ω	120Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	120Ω		
V 7	6AL5	.4Ω	27Ω	.1Ω	0Ω	5Meg	0Ω	5.6KΩ		
V 8	6CB6	5.6KΩ	85Ω	.1Ω	0Ω	†7KΩ	†2.5KΩ	0Ω		
V 9	6AU6	†5.5KΩ	†1.7KΩ	¶.1Ω	¶0Ω	400KΩ	†150Ω	†1.7KΩ		
V 10	6AU6	100KΩ	0Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	1.8KΩ		
V 11	6AU6	47KΩ	0Ω	.1Ω	0Ω	†9KΩ	†3.5KΩ	1KΩ		
V 12	6AL5	INF	INF	0Ω	.1Ω	0Ω	0Ω	20KΩ		
V 13	6SQ7	0Ω	10Meg	0Ω	540KΩ	540KΩ	†220KΩ	.1Ω	0Ω	
V 14	6K6GT	INF	.1Ω	†1.9KΩ	†1.5KΩ	470KΩ	INF	0Ω	560Ω	
V 15	6AU6	5Meg	0Ω	.1Ω	0Ω	†330KΩ	†27KΩ	0Ω		
V 16	6SN7GT	5Meg	5Meg	27Ω	†330KΩ	†6KΩ	4KΩ	.1Ω	0Ω	
V 17	6SN7GT	4.7Meg	#190KΩ	1KΩ	1.5Meg	#690KΩ	1KΩ	.1Ω	0Ω	
V 18	6S4	INF	2.8KΩ	1.1Meg	0Ω	.1Ω	1.1Meg	INF	INF	#11.6KΩ
V 19	6SN7GT	4.7Meg	†18KΩ	1.5KΩ	90KΩ	†190KΩ	1.5KΩ	.1Ω	0Ω	
V 20	6BG6G	700KΩ	0Ω	120Ω	500KΩ	500KΩ	†10KΩ	.1Ω	†8.3KΩ	Top Cap #18Ω
V 21	6W4GT	INF	INF	280KΩ	INF	†150Ω	#18Ω	■0Ω	■.1Ω	
V 22	1B3GT	PINS	1 - 8	HAVE	INF	RESISTANCE				Top Cap #243Ω
V 23	5U4G	INF	14KΩ	†150Ω	26Ω	†1.7Ω	27Ω	†1.7KΩ	14KΩ	
V 24	21FP4A	¶0Ω	†40KΩ	Pin 6 #400KΩ	Pin 10 #10KΩ	Pin 11 †335KΩ	Pin 12 ¶.1Ω			

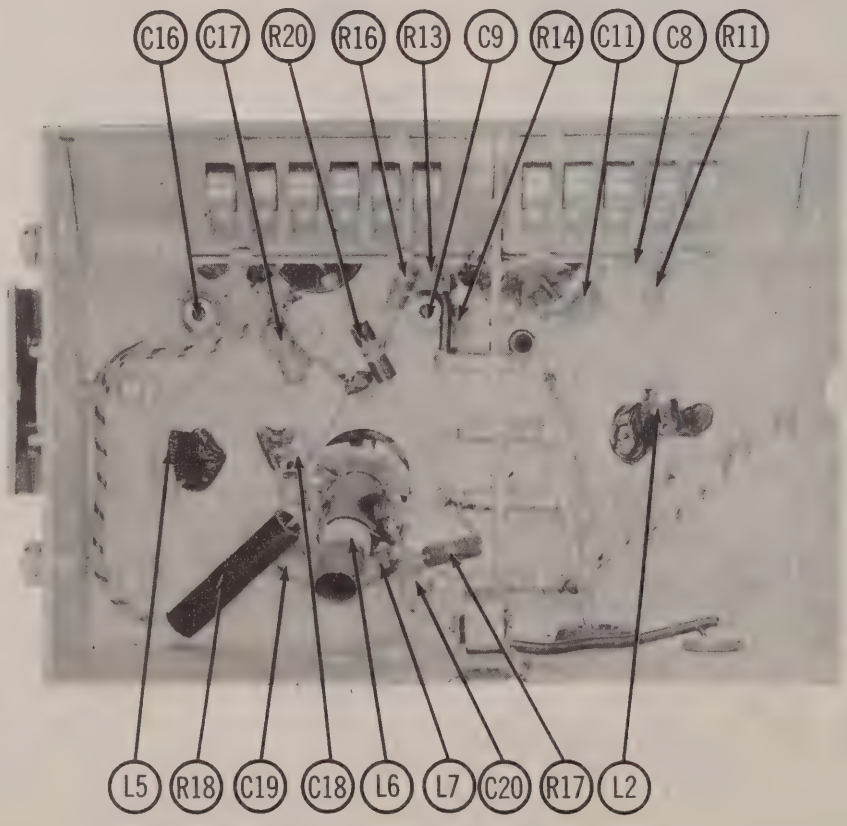
† MEASURED FROM PIN 8 OF V23.
# MEASURED FROM PIN 3 OF V21.
¶ MEASURED FROM PIN 7 OF V9
■ MEASURED FROM PIN 7 OF V21



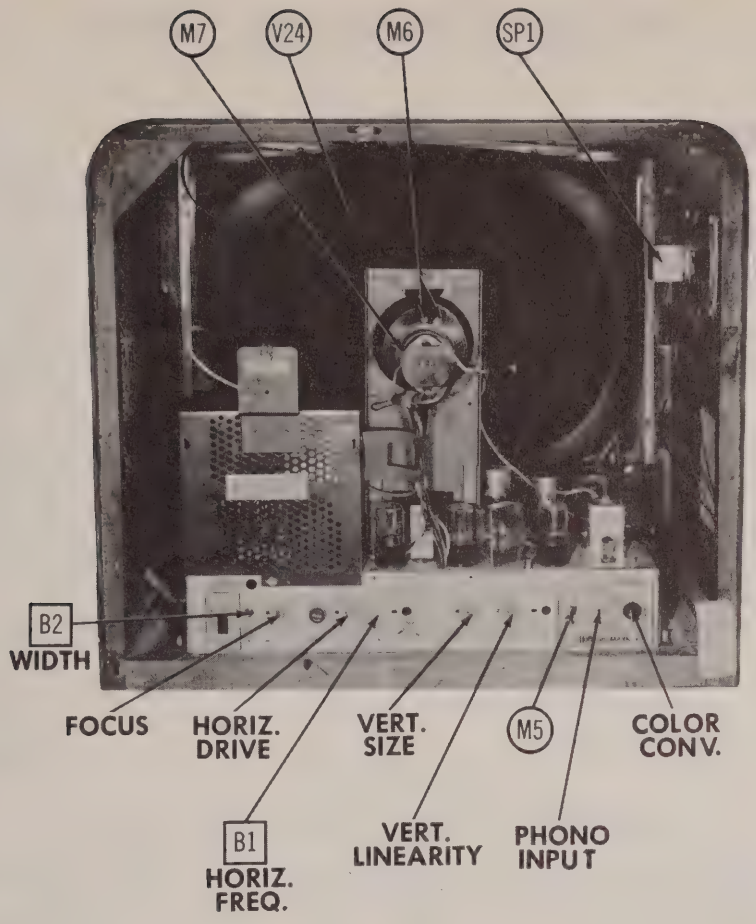
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal drive control counter clockwise until a vertical white bar appears on the picture, then turn control clockwise just far enough to eliminate the bar.

If no bar appears leave control at the maximum counter clockwise position.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug (B1) clockwise until horizontal sync is lost.

Turn B1 counter clockwise and check the point where sync pull-in occurs, then turn B1 an addition $\frac{1}{2}$ turn counter clockwise.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Substitute V19, V20 and V21. Check waveform W14;

If Unsatisfactory	If Satisfactory
Check components of horizontal multivibrator (V19).	Check components of horizontal output and damper ckts. Check T2 and T4A.

INSUFFICIENT SWEEP

If substitution of V19, V20 and V21 does not correct this, follow procedure, outlined under loss of horizontal sweep.

DRIVE LINES

Check setting of drive control. Substitute V20. Check associated components, particularly C85 and C90.

COMPRESSED AT LEFT SIDE

Substitute V20 and V21. Check C91 and C92.

FOLDS

Substitute V21 and check associated components.

XMAS TREE EFFECT

Substitute V19. Check L26 and C86. Check associated components.

VERTICAL

LOSS OF SWEEP

If substitution of V17 and V18 does not correct this trouble, check waveform W8;

If Unsatisfactory	If Satisfactory
Check components in vertical oscillator circuit.	Check components in vertical output circuit particularly T3 and T4B.

INSUFFICIENT SWEEP

If adjustment of the height and vertical linearity controls and the substitution of V17 and V18 does not correct this, follow procedure outlined under vertical loss of sweep.

COMPRESSED AT TOP

Substitute V18 and check circuit components.

FOLDS

Substitute V18 and check C79.

SYNC

HORIZONTAL

LOSS OF SYNC

Substitute V15, V16, V7 and V19. Check waveform W11;

If Unsatisfactory	If Satisfactory
Check components of 1st. and 2nd. sync separator, particularly C83.	Chetk components of Horiz. phase detector and multivibrator particularly C82.

CRITICAL SYNC

Substitute V7 and V16. Check horizontal phase detector components. Check C84.

PULLING PICTURE

Substitute V7 and V16. Check associated components.

VERTICAL

LOSS OF SYNC

Check waveform W7;

If Unsatisfactory	If Satisfactory
Substitute V15 and V16. Check associated components particularly the integrator network.	Substitute V17. Check circuit components.

CRITICAL SYNC

If after substitution V15, V16 and V17, there is no change, follow procedure outlined under vertical, loss of sync.

VIDEO

SOUND BARS

Check adjustment of 4.5MC trap. Check setting of local oscillator and alignment of IF stages.

POOR RESOLUTION

Check alignment of tuner and IF stages. Substitute V8 and check associated components.

POOR CONTRAST

Check waveform W2.

If Unsatisfactory	If Satisfactory
Substitute V8, V9 and V13. Check associated components.	Check picture tube and components.

SMEAR

Substitute V8 and check circuit components.

ONE BLACK BAR ACROSS PICTURE

Check tuner, IF and video amplifier tubes for heater to cathode leakage.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: HOFFMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	RF Amplifier	6BK7	6BK7	9AJ	
B	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector- Horiz. AFC	6AL5	6AL5	6BT	
V8	Video Output	6CB6	6CB6	7CM	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V11	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V12	Ratio Detector	6AL5	6AL5	6BT	
V13	AF Amplifier - AGC Clamper	6SQ7	6SQ7	8Q	
V14	Audio Output	6K6GT	6K6GT	7S	
V15	1st. Sync Separator	6AU6	6AU6	7BK	
V16	2nd. Sync Separator Horiz. AFC	6SN7GT	6SN7GT	8BD	
V17	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V18	Vert. Output	6S4	6S4	9AC	
V19	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V20	Horiz. Output	6BG6G	6BG6G	5BT	
V21	Damper	6W4GT	6W4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	

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CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: HOFFMAN PART No.	SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V24A	21FP4A	21FP4A		12C	① Circuit changes necessary
B	21FP4 ①	21FP4 ①		12C	
C	17HP4			12C	
D	20HP4 ①			12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▰40	475	4232	E4C335		CO35		FP397	TVL-3843	
B	▲30	475						TC83		
C	■30	475								
C2	60	450	4242	AFH1-54		A050		FP237	TVL-2759	Note 1
C3A	■40	475	4228	AFH4-94		D068		FP476	TVL-4822	Note 1
B	▲20	450								Note 1
C	▰10	475								Note 1
D	5	50								Note 2
C4	4	450	4236	PRS450/4		BR445		TC70	TVA-1702	Note 3
C5A	▲50	50	4230	E3C262		BO64		FP230	TVL-3801	
B	■20	475				BR505		TC26		Note 4
C	20	25								Note 5
C6	5	50	4209	PRS150/4		BR550		TC30	TVA-1303	
C7	2.2				TCZ-2.2		NP0K-2R2		5TCCB-V22	
C8	3-8				829-10					
C9	.5-3				892-3			CT565A		
C10	100			BPD-0001	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C11	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C12	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C13	.5-3				829-3			CT565A		
C14	20			SI20NP0	TCZ-20		NP0K-200	ZT-542	5TCC-Q2	
C15	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C16	.5-3				829-3			CT565A		
C17	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C18	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C19	73									
C20	300			SI300	D6-301		GP2K-301	UC-533	5GA-T3	
C21	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C22	.22	200	4131	P488-22		PTE4P22		PT4025	2TM-P22	
C23	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C24	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C25	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C26	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C27	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C28	220		4026	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C29	1.5		4082	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C30	10			SI10	D6-100	5W5Q1	GP1K-100	UC-541	5GA-Q1	
C31	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C32	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C33	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C34	1.0	100	14200	484-1.0		PJ2W1		PT41	2TM-M1	
C35	220		4026	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C36	5		4081	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C37	130			SI130	D6-131		GP2K-131			
C38	47		14011	SI47NP0	TCZ-47		NP0K-470	ZT-5447	5TCC-Q47	
C39	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C40	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C41	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C42	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C43	220		4026	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C44	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C45	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C46	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C47	39			SI39NP0	TCZ-39		NP0K-390		5TCC-Q39	
C48	1.5		4082	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C49	20			SI20	D6-200	5W5Q2	GP1K-200	UC-542	5GA-Q2	
C50	5000		4029	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	HOFFMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C51	5		4081	S1SNP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C52	5000		4029	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C53	47			S1NTNP0	TCZ-47		NP0K-470	ZT-5447	5TCC-Q47	
C54	.22	200	4131	P488-22	PTE4P22			PT4025	2TM-P22	
C55	500	1000	14017	1467L-HV-0005	1WP15T5			MCK347	10GAB-T47	Note 6
C56	5		4081	S1SNP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C57	5000		4029	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C58	5000		4029	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	Note 7
C59	4000									Note 7
C60	47		4026	S1147	D6-470		GP1K-470	UC-5447	5GA-Q47	Note 8
C61	47		4026	S1147	D6-470		GP1K-470	UC-5447	5GA-Q47	Note 9
C62	5000		4029	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C63	5000		4029	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C64A	4000		4036	BPD-2X004	D6-402	TMSDD4	822-004	DCD-534	5HK-2D4	
B	4000				D6-402					
C65	5000		4029	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C66	.001	600	14013	1479-001		SR5D1		MCB255		
C67	.0047	400	4127	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C68	.0047	400	4127	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C69	5000		4029	BPD-005	DD-502	TMSD5	811-005	DC-525	5HK-D5	
C70	.01	600	4105	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	Note 5
C71	.01	600	4105	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	Notes 5, 10
C72	.0022	400	4136	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C73	220		4026	S1220	D6-221		GP2K-221	UC-5322	5GA-T22	
C74	.0047	400	4127	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C75A	.002		P688-002			PTE6D2		PT622		
B	.005		P688-005	♦9695	♦PC-100	PTE6D5	♦1406-01	PT625	♦101C1	
C	.005		P688-005			PTE6D5		PT625		
C76	.0039	600	14113	1464-004		1DR5D4		MCB463	MS-24	
C77	.047	200	4158							
C78	.1	600	14133							
C79	.1	600	4144	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C80	.047	600	4133	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C81	.022	600	4124	P688-022	DF-203	PTE6S22		PT4122	4TM-S22	
C82	.001	400	4175	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C83	.001	400	4175	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C84	.0047	400	4127	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C85	.047	200	4147	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C86	3900	500	4085	1464-004		1DR5D4		MCB463	MS-24	
C87	470	500	14009	1469-0005		5R5T5		MCB245	MS-35	
C88	.001	600	14104	1479-001		3R5D1		MCB255	MS-21	
C89	390	500	14010	1469-0004		5R5T4		MCB243	MS-34	
C90	.0047	600	4128	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C91	.22	600	4129	684-25		PTE6P25		PT6025	6TM-P25	Note 11
C92	.0047	600	4128	P688-0047	D6-472	PTE6D47	GP2-333-472	PT 6247	6TM-D47	Note 12
C93	.1	600	14133	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C94	82	1500	4087							Note 6
C95	500	20000	4056	HV20C	TV3-502	MM-C20T5	413-501		20DK-T5	
C96	.1	600	4144	P688-1	DF-104	PTE6P1		PT601	6TM-P1	Note 4
C97	.01	600	4105	689ZGXY-01		PJ6S1		PT611	6TM-S1	
C98	.01	600	4105	689ZGXY-01		PJ6S1		PT611	6TM-S1	
C99	.039	600	14128							Note 13

Note 1. C2, C3A, C3B, C3C are combined in one unit (Part #4247) on Ch. 190B and 191B
Note 2. Ch. 190B and 191B use .47MFD in this application (Part #4173).
Note 3. Ch. 190B and 191B use .1MFD in this application (Part #4144).
Note 4. C5B replaces C96 in Ch. 192.
Note 5. Not used in Ch. 192.
Note 6. Ch. 190B, 191B use 47MMF in this application (Part #4067).
Note 7. Some Models combine C58 and C59 in one 2 x 4000MMF unit (Part #4036).
When C58 is single 5000MMF, C59 is not used.
Note 8. Not used in all Models.
Note 9. Some Models use 220MMF in this application (Part #4026)
Note 10. Some Models use .0047MFD in this application (Part #4128)
Note 11. Ch. 190B and 191B use .033MFD in this application (Part #4127).
Note 12. Ch. 190B and 191B use .22MFD in this application (Part #4103).
Note 13. Used in Ch. 190B and 191B only.
♦ Items C75A, C75B, C75C, R85A, R85B, R85C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	HOFFMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	4863	QJ-371 *	RTV-369	3BB-6268	UF152L †	Contrast-Panel-Note 1
B	500KΩ	½					UR55A †	Volume-Rear
C	Switch						US-26 †	Attach to R1B
R2A	1Meg	½	4868	QU-137	AG-61-S	AB-69	U-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	50KΩ	½	4867	QU-123	AG-44-S	AB-31	U-35	Brightness
B	Shaft		Not Req.	Not Req.	[illegible]	AK-4	Not Req.	Attach to R3A
R4A	25KΩ	½	4869	QU-120	AG-40-S	AB-26	U-29	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R4A
R5A	5000Ω	½	4865	QU-114	AG-19-S	AB-10	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	2Meg	½	4864	QU-139	AG-83-S	AB-75	SU-56	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	25KΩ	½	4859	QU-120	AG-40-S	AB-26	SU-29	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	2Meg	½	4864	QU-139	AG-83-S	AB-75	SU-56	Focus
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A
R9	50KΩ	½						AGC-Note 2

Note 1. In Ch. 192 the volume control is omitted. The contrast control and switch becomes part #4866.
Note 2. Used only in Ch. 190B.
* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B17-109 & P2-209 (Panel), B13-133 & R1-226 (Rear) & SWITCH 76-1
† UNIVERSAL REPLACEMENT (Mallory exact duplicate part #UE178S).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	HOFFMAN PART No.	IRC PART No.	NOTES
R10	22KΩ	½		BTS-22K	
R11	47KΩ	½		BTS-47K	
R12	220KΩ	½		BTS-220K	
R13	1000Ω	½		BTS-1000	
R14	180KΩ	½		BTS-180K	
R15	4700Ω	½		BTS-4700	
R16	320KΩ	½			
R17	15KΩ	½		BTS-15K	
R18	10Ω	½			
R19	10KΩ	½		BTS-10K	
R20	10KΩ	½		BTS-10K	
R21	1000Ω	½	4542	BTS-1000	
R22	330Ω	½	4509	BTS-330	
R23	47KΩ 5%	½	4537	BTS-47K 5%	Note 2
R24	43000Ω 5%	½	24553	BTS-4300 5%	
R25	68Ω	½	4593		
R26	1000Ω	½	4542	BTS-1000	
R27	15KΩ	½	4619	BTS-15K	Note 2
R28	56000Ω 5%	½	4603		
R29	120Ω	½	4546	BTS-120	
R30	1000Ω	½	4542	BTS-1000	
R31	330Ω	½	4509	BTS-330	
R32	33000Ω	½	4607	BTS-3300	
R33	56000Ω 5%	½	4603		Note 18
R34	68Ω	½	4593		
R35	27000Ω 5%	½	24533	BTS-2700 5%	
R36	1000Ω	½	4542	BTS-1000	
R37	470KΩ 5%	½	34550	BTS-470K 5%	
R38	330KΩ 5%	½	34532	BTS-330K 5%	
R39	180KΩ	½	4634	BTS-180K	Note 3
R40	4.7Meg	½	34659	BTS-4.7Meg	
R41	120Ω	½	4546	BTS-120	
R42	1000Ω	½	4542	BTS-1000	
R43	56000Ω 5%	½	4603		
R44	47000Ω 5%	½	4649	BTS-4700 5%	
R45	56000Ω 5%	½	4603	BTS-5600 5%	
R46	680Ω	½	4514	BTS-680	
R47	15000Ω 5%	½	4610	BTS-1500 5%	
R48	33000Ω 5%	½	4648	BTS-3300 5%	
R49	470Ω	½	4638	BTS-470	
R50	15KΩ	½	4619	BTS-15K	
R51	330KΩ	½	34531	BTS-330K	
R52	22KΩ	½	4501	BTS-22K	
R53	68KΩ	½	4661	BTS-68K	Note 10
R54	47KΩ	½	4504	BTS-47K	Note 7
R55	4.7Meg	½	34659	BTS-4.7Meg	Note 7
R56	22KΩ	½	4628	BTS-22K	Note 7
R57	100KΩ	½	4511		
R58	1800Ω	½	4640	BTS-1800	Note 8
R59	1000Ω	½	4542	BTS-1000	
R60	47KΩ	½	4504		Note 9
R61	1000Ω	½	4598	BTS-1000	Note 19
R62	1000Ω	½	4542	BTS-1000	
R63	6800Ω	1	4608	BTA-6800	
R64	10KΩ	1	4597	BTA-10K	
R65	470Ω	½	4638	BTS-470	
R66	15KΩ	½	4521	BTS-15K	
R67	10KΩ	½	4597	BTS-10K	
R68	10KΩ	½	4597	BTS-10K	
R69	10Meg	½	4505	BTS-10Meg	Note 4
R70	220KΩ	½	4618	BTS-220K	Note 4
R71	1.8Meg 5%	½	34612	BTS-1.8Meg 5%	
R72	470KΩ	1	4506	BTS-470K	Note 4
R73	560Ω	1	4621	BTA-560	Note 4
R74	820Ω	1	4588	BTA-820	Note 4, 11
R75	470KΩ	½	4623	BTS-470K	
R76	4.7Meg	½	4544	BTS-4.7Meg	
R77	82KΩ	½	24670	BTS-82K	
R78	330KΩ	½	34531	BTS-330K	
R79	18KΩ	½	4662	BTS-18K	
R80	1800Ω 5%	½	24517	BTS-1800 5%	
R81	1800Ω 5%	½	24517	BTS-1800 5%	
R82	390Ω	½	4549	BTS-390	
R83	22000Ω 5%	½	24525	BTS-2200 5%	
R84	22000Ω 5%	½	24525	BTS-2200 5%	
R85A	22KΩ	½		BTS-22K	
B	8200Ω	½	♦9695	BTS-8200	
C	8200Ω	½		BTS-8200	
R86	4.7Meg	½	4544	BTS-4.7Meg	
R87	1000Ω	½	4659	BTS-1000	
R88	180KΩ	1	34507	BTA-180K	
R89	1.2Meg	½	34593	BTS-1.2Meg	
R90	680KΩ	1	34571	BTA-680K	
R91	5600Ω	½	4629	BTS-5600	
R92	470Ω	½	4664	BTS-470	
R93	150KΩ	1	24697	BTA-150K	
R94	10KΩ	5	4737	1-3/4A-10K	Note 12
R95	560Ω	½	4507	BTS-560	
R96	560Ω	½	4507	BTS-560	
R97	100KΩ	1	4571	BTA-100K	Note 1
R98	2700Ω	½	4579	BTS-2700	
R99	27Ω	1	14536		Note 16
R100	100KΩ	½	4571	BTS-100K	
R101	100KΩ	½	4571	BTS-100K	
R102	470KΩ	½	4506	BTS-470K	
R103	4.7Meg	½	4544	BTS-4.7Meg	
R104	15000 5%	½	4610	BTS-1500 5%	
R105	8200Ω	½	4651	BTS-8200	
R106	82KΩ	½	24670	BTS-82K	
R107	180KΩ	½	4634	BTS-180K	
R108	10KΩ	½	4597	BTS-10K	Note 13
R109	6800Ω	½	4557	BTS-6800	Note 14
R110	560KΩ	½	4590	BTS-560K	
R111	100Ω	½	4566		
R112	120Ω	2	4657	BW-2-120	
R113	8200Ω	1	4658	BTA-8200	Note 15
R114	4.7Ω	½			Note 17
R115	150Ω	10	4730	1 3/4A-150	
R116	500Ω	15	4756	2D-500	Note 6
R117A	1100Ω	10	4731		
B	800Ω				
R118	75Ω	10	4757	1 3/4A-75	Note 5
R119	1000Ω	½	4542	BTS-1000	

♦ Items R85A, R85B, R85C, C75A, C75B, C75C are combined in one unit.
Note 1. Not used in later production models.
Note 2. Ch. 190B replaces this resistor with an AGC control & a 15KΩ (R27) resistor to ground.
Note 3. Ch. 190B uses a 330KΩ resistor in this application.
Note 4. Not used in Ch. 192
Note 5. Used only in Ch. 192
Note 6. Ch. 192 uses a 750Ω (15 watt) resistor in this application. Ch. 190B and 191B use a 150Ω (10 watt) resistor in this application.
Note 7. Used only in Ch. 190B and 191B.
Note 8. Some Models may use a 68Ω resistor in this application.
Note 9. Some Models may use a 33KΩ resistor in this application.
Note 10. Ch. 190B and 191B use a 47KΩ resistor in this application.
Note 11. Ch. 190B and 191B use a 1000Ω resistor in this application.
Note 12. Ch. 190B and 191B use a 1500Ω (1 watt) resistor in this application.
Note 13. Ch. 190B and 191B use a 1000Ω resistor in this application.
Note 14. Ch. 190B and 191B use 8200Ω resistor in this application.
Note 15. Ch. 190B and 191B use 8800Ω (2 watt) resistor in this application.
Note 16. Ch. 190B and 191B use 22Ω (2 watt) resistor in this application.
Note 17. Some Models may use a 3.9Ω resistor in this application.
Note 18. Some Models may use a 3900Ω resistor in this application.
Note 19. Some Models may use a 82Ω resistor in this application.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	HOFFMAN PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5 1/4"	PM	3.3Ω	9067-1	8T-803 Mod. P525-V	52A1	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC @ 2.08A	730VCT .220ADC	5VAC @ 3A	6.3VAC @ .84A	5029 5030 ①	P-8169	P-3078		R38BC	
			SEC. 4	SEC. 5						
			6.3VAC @ 1.2A	6.3VAC @ 8A						

① Power Trans. used in Ch. 190B, 191B.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	270.5Ω tap ② 90Ω, 2.5Ω 9.5Ω, 17.5Ω, 35.5Ω	0Ω	5155 5180 ②		HVO-9 ①	TFB-13 ③	D-2 D-19 ③	230T1 ②	Horiz. Output Trans. Horiz. Output Trans.
T3	1600Ω tap ④ 5Ω		5157	A-8141	A-3039	TSO-12	A-104X	226T1	Vert. Output Trans.
T4A	30Ω		9712	DY-11A ④	MDF-71 ④	TY-7 ④	Y-19 ④		Horiz. Deflection Coils
B	50Ω								Vert. Deflection Coils
T5	6.5Ω tap ⑤ 2.5Ω .9Ω		5422 ⑤ 5317 5423 ⑦			TL-3	WC-12		Horiz. Lin. Coil Width Coil Width Coil
T6									

① Use with Width Coil MWC-1
② Horiz. Output Trans. used on Ch. 190B and 191B
③ Wire as on original circuit except : Connect present terminal #4 to new terminal #5. Connect present terminal "T" to new terminal #4.
④ Use original deflection coil network except delete 100KΩ shunting resistor.
⑤ Used on Ch. 190B and 191B
⑦ Width coil used on Ch. 190B and 191B.
⑧ Use with width coil 213R1.
⑨ See instruction sheet packed with unit for terminal connections.

PROPERTY OF L. F. E[illegible]

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	HOFFMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T7	6.7KΩ	3.3Ω	382Ω	.3Ω	5158 ②	A-3877 ①	A-2930 ①	RO-9 ①	S-7X ①	① Drill one new mounting hole. ② This trans. not used in Ch.192.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	HOFFMAN PART No.	MILLER PART No.	NOTES
L1A	Ant. Coil	0Ω CT	0Ω	5360		Channel 2
B	Ant. Coil	0Ω CT	0Ω	5361		Channel 3
C	Ant. Coil	0Ω CT	0Ω	5362		Channel 4
D	Ant. Coil	0Ω CT	0Ω	5363		Channel 5
E	Ant. Coil	0Ω CT	0Ω	5364		Channel 6
F	Ant. Coil	0Ω CT	0Ω	5365		Channel 7
G	Ant. coil	0Ω CT	0Ω	5366		Channel 8
H	Ant. Coil	0Ω CT	0Ω	5367		Channel 9
I	Ant. Coil	0Ω CT	0Ω	5368		Channel 10
J	Ant. Coil	0Ω CT	0Ω	5369		Channel 11
K	Ant. Coil	0Ω CT	0Ω	5370		Channel 12
L	Ant. Coil	0Ω CT	0Ω	5371		Channel 13
L2	Fil. Choke	0Ω				
L3	Neutr.Coil	0Ω				
L4A	RF,Mixer Grid & Osc. Coil	0Ω		5348		Channel 2
B	RF,Mixer Grid & Osc. Coil	0Ω		5349		Channel 3
C	RF,Mixer Grid & Osc. Coil	0Ω		5350		Channel 4
D	RF, Mixer Grid & Osc. Coil	0Ω		5351		Channel 5
E	RF, Mixer Grid & Osc. Coil	0Ω		5352		Channel 6
F	RF, Mixer Grid & Osc. Coil	0Ω		5353		Channel 7
G	RF, Mixer Grid & Osc. Coil	0Ω		5354		Channel 8
H	RF, Mixer Grid & Osc. Coil	0Ω		5355		Channel 9
I	RF, Mixer Grid & Osc. Coil	0Ω		5356		Channel 10
J	RF, Mixer Grid & Osc. Coil	0Ω		5357		Channel 11
K	RF, Mixer Grid & Osc. Coil	0Ω		5358		Channel 12
L	RF, Mixer Grid & Osc. Coil	0Ω		5359		Channel 13
L5	Fil. Choke	0Ω				
L6	Conv.Plate	.4Ω				
L7	RF Choke	.5Ω				
L8	1st. Video IF	.2Ω		5298	6171 *	
L9	2nd. Video IF	.2Ω		5298	6188 *	
L10	27MC Trap	.2Ω		5396	6171A	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF) (CONT.)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA HOFFMAN PART No.	REPLACEMENT DATA MILLER PART No.	NOTES
L11	3rd. Video IF	.2Ω		5298	6171 *	
L12	21MC Trap	0Ω		5394		
L13	4th. Video IF	.2Ω		5298	6171 *	
L14	5th. Video IF	.4Ω	.4Ω	5420		
L15	Sound Trap	0Ω	0Ω	5299	6193	
L16	Cathode Trap	.2Ω		5395	6171 *	
L17	Series Peaking Coil	10Ω		5433	4644 †	150 Microhenries, wound on 39KΩ resistor
L18	Shunt Peaking Coil	26Ω		5434		970 Microhenries
L19	4.5MC Trap	9.5Ω		5402	1470	
L20	Series Peaking Coil	7Ω		5435	4642 ■	100 Microhenries, wound on 18KΩ resistor
L21	Shunt Peaking Coil	13.5Ω		5436	6181	270 Microhenries
L22	1st. Sound IF	5.5Ω		5430	1470	
L23	Fil. Choke	0Ω		5133		
L24	2nd. Sound IF	2.6Ω		5428	1470	Note 1
L25	Ratio Det.	4.2Ω	.2Ω CT	5429	6205 ▲	Tertiary Winding - .7Ω
L26	Horiz. Osc.	125Ω		5300	6210	
L27	RF Choke			5266		Used in Ch. 190B & 191B only
L28	RF Choke			5266		Used in Ch. 190B & 191B only

▲ Use adaptor plate
* Enlarge mounting hole.
† Parallel with 39KΩ resistor
■ Parallel with 18KΩ resistor
Note 1. Ch. 190B & 191B use Hoffman part #5437 in this application.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA HOFFMAN PART No. FUSE	HOFFMAN PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG Slo/Blo	3A 125V	9648		313003 (3AG-3A-Slo-Blo	342001	MDL-3	HKP
M2	3AG	1/4A 250V	9515		312.250 (3AG-1/4A)	357001	AGC 1/4	4405 ①

① Ch. 190B and 191B use 1/4A fuse (Part #9715) or 150MA fuse (Part #9717)

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA HOFFMAN PART No.		NOTES
M3	Bayonet	7.5	.2	White	9676		Type #51

MISCELLANEOUS

ITEM No.	PART NAME	HOFFMAN PART No.	NOTES
M4	RF Tuner	9717	
M5	Switch	6028	TV-Phono Selector
M6	Centering Magnet	9722	
M7	Ion Trap	9713	
	Cabinet	7646	Model 7M103
	Cabinet	7645	Model 7B104
	Cabinet	7652	Model 7P105
	Cabinet	7656	Model 7M302
	Cabinet	7657	Model 7B303
	Cabinet	7659	Model 21M106
	Cabinet	7660	Model 21B107
	Cabinet	7661	Model 21P108
	Cabinet	7647	Model 21M300
	Cabinet	7651	Model 21B301
	Cabinet	7648	Model 21M503
	Cabinet	7649	Model 21B504
	Cabinet	7650	Model 21P505
	Cabinet	7662	Model 20M101F
	Cabinet	7663	Model 20B102F
	Cabinet	7653	Model 21M900
	Cabinet	7654	Model 21B901
	Cabinet	7655	Model 21P902
	Back Assy.	33547	Models 7M103, 7B104, 7P105
	Back Assy.	33570	Models 7M302, 7B303
	Back Assy.	33563	Models 21M106, 21B107, 21P108
	Back Assy.	33558	Models 21M300, 21B301, 21M503, 21B504, 21P505
	Back Assy.	33553	Models 20M101F, 20B102F
	Back Assy.	33564	Models 21M900, 21B901, 21P902
	Safety Glass	751	Models 7M103, 7B104, 7P105, 7M302, 7B303
	Safety Glass	769	Models 21M106, 21B107, 21P108, 21M300, 21B301, 21M503, 21B504, 21P505, 21M900, 21B901, 21P902
	Safety Glass	768	Models 20M101F, 20B102F
	Frame	2519	Models 7M103, 7B104, 7P105, 7M302, 7B303
	Mask	3755	Models 7M103, 7B104, 7P105, 7M302, 7B303
	Mask	3816	Models 21M106, 21B107, 21P108, 21M300, 21B301, 21M503, 21B504, 21P505, 21M900, 21B901, 21P902
	Mask	3805	Models 20M101F, 20B102F
	Knob	33560	Channel Selector, All Models
	Knob	33520	Off/On Volume, All Models except 21M900, 21B901, 21P902
	Knob	33505	Contrast, All Models except 21M900, 21B901, 21P 902
	Knob	3813	Brightness, All Models
	Knob	3814	Vertical Hold, All Models
	Knob	3815	Horiz. Hold, All Models
	Knob	33556	Off/On contrast (Outer), Models 21M900, 21B901, 21P902
	Knob	33557	Off/On Contrast (Skirt), Models 21M900, 21B801, 21P902
	Knob	33565	Tuning (Radio) Models 21M900, 21B901, 21P902
	Knob	33567	Function Selector, Models 21M900, 21B901, 21P902
	Knob	33568	Volume, Models 21M900, 21B901, 21P902
	Knob	33571	Bass, Models 21M900, 21B901, 21P902
	Knob	33566	Treble , Models 21M900, 21B901, 21P902

TROUBLE SHOOTING AIDS – CONT

PROPERTY OF
L. F. BLANKENSHIP

AUDIO

WEAK OR NO SOUND

Check speaker switch. Substitute V10, V11, V12, V13 and V14. Check associated components, particularly L27, C48 and T5.

BUZZ

Substitute V12. Adjust L29 secondary for minimum buzz. Check oscillator setting. Check for overload at W1. If overloading exists, check AGC network.

DISTORTED

Check audio stages using audio signal generator.

If Undistored	If Distorted
Check adjustment of L22. Substitute V10, V11 and V12. Check associated components.	Substitute V13 and V14. Check components and speaker.

POWER

SMALL RASTER

Substitute V23. Check filter pcomponents.

DIM PICTURE

Substitute V23. Check B plus components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check waveform W14:

If Unsatisfactory	If Satisfactory
Substitute V19 and check associated components.	Check 1/4Amp. fuse located in hi-voltage cage. Substitute V20, V21 and V22. Check associated components. including T2 and T4.

WEAK HIGH VOLTAGE

Follow procedure outlined under loss of high voltage.

BLOOMING

If substitution of V19, V20, V21 and V22 does not correct trouble, follow procedure outlined under loss of high voltage.

GENERAL

NO PICTURE, NO SOUND, NO SOUND

Substitute V2, V3, V4, V5, V6, V9 and V13. Check associated components.

SNOW BUT NO PICTURE OR SOUND

Substitute V1 and V2. Check tuner components.

SNOWY PICTURE, GOOD SOUND (IN STRONG SIGNAL AREAS)

Check video IF tubes and components.

INTERMITTANT STREAKS

Check high voltage circuit for corona leakage and arcing.

Symptoms shown above are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

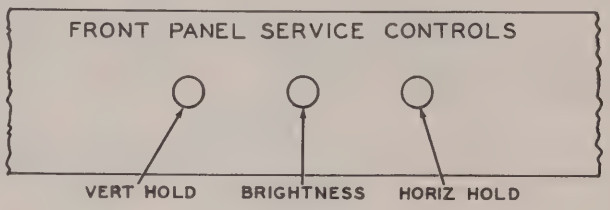
PICTURE TUBE SAFETY GLASS CLEANING

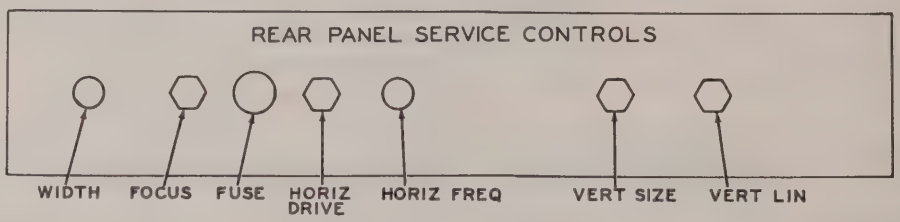
For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





HORIZONTAL OSCILLATOR FIELD ADJUST MENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the Horiz. Hold Control at the mid-position of its range and adjust the Horiz. Freq. slug until the picture synchronizes horizontally.

SOUND IF DET. BUZZ ADJUSTMENT

To eliminate Sound IF Detector buzz, adjust the Ratio Detector Secondary , L25, located on top of chassis. (See tube placement chart).

FUSES

Two fuses are used. One for Horiz. Sweep Circuit protection and one for LV Power Supply protection (For location, see tube placement chart).

CENTERING

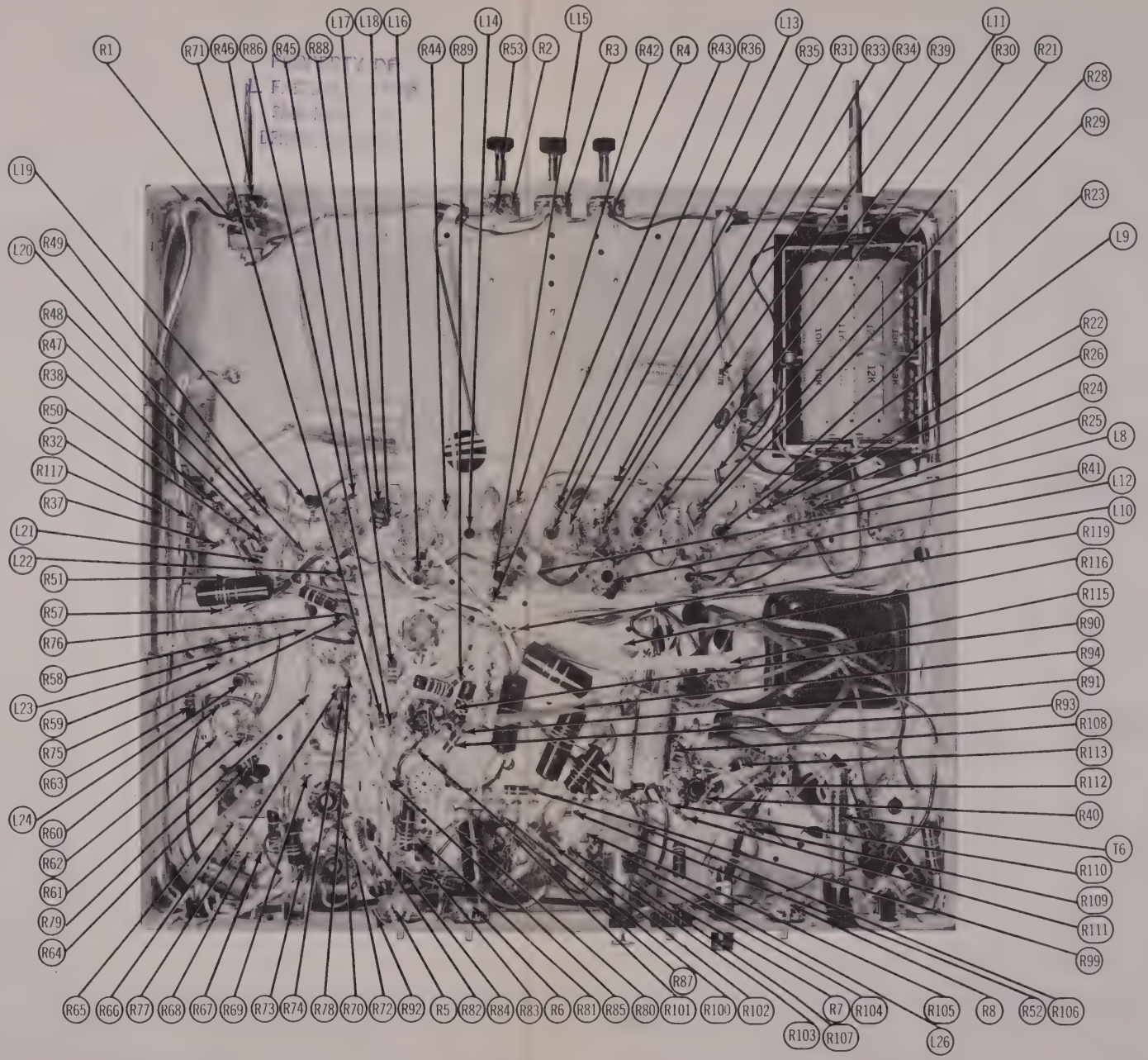
Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

BUILT-IN ANTENNA TUNING

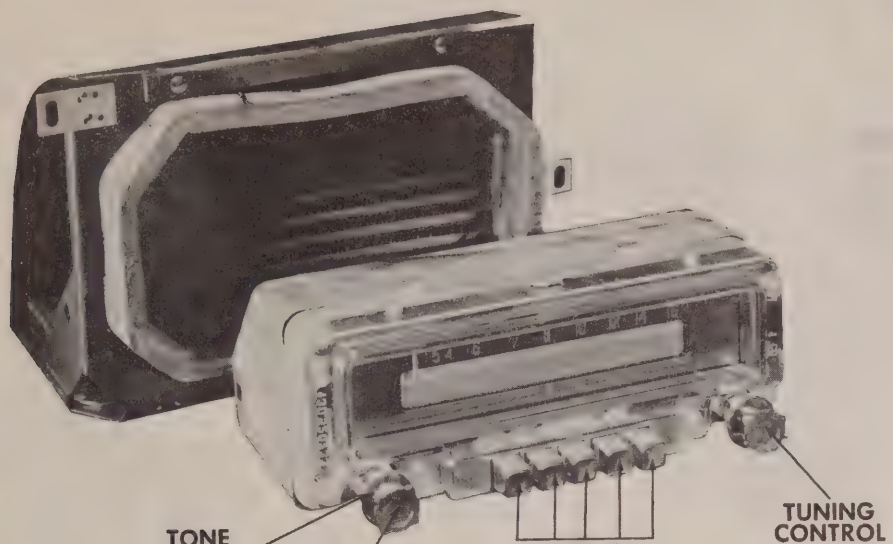
The built-in antenna can be adjusted from the rear of the cabinet. Adjust for a picture of maximum contrast and minimum ghosts.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Disconnect built-in antenna.
3. Remove 7 wood screws. Remove rear cover.
4. Disconnect speaker; Remove 4 speaker nuts. Remove speaker.
5. Remove 4 chassis bolts. Remove chassis.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



TRADE NAME	Mopar 609 (For 1953 Dodge Models D44, D46, D47 & D48)
MANUFACTURER	Motorola, Inc., 4545 Augusta Blvd., Chicago 51, Illinois.
TYPE SET	Battery operated AM Superheterodyne Automobile Receiver
TUBES (Six)	Types: 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6X4 Rectifier.
POWER SUPPLY	6 Volt Storage Battery
TUNING RANGE—BROADCAST	540-1600 KC
RATING	7.5 Amp. @ 6.3 volts DC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400Ω Mod)	Extreme high frequency end of travel.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1.	Thru dummy to antenna receptacle.	1610KC	"	"	A5, A6, A7	Preset tuner cores A8, A9, and A10 so that 1-3/16 inch of core projects from coil form. Adjust A5, A6 and A7 for maximum output in order given.
3	"	"	1400KC	Tune manually for pointer position as in Fig. 2.	"	A8, A9, A10	Adjust for maximum output in order given.
4.	"	"	1610KC	Tune to 1610KC signal.	"	A6, A7	"
5.	"	"	1400KC	Tune to 1400KC signal.	"	A9, A10	"
6.		Repeat Step 4.					

With set installed in car and antenna fully extended peak A7 for maximum volume.

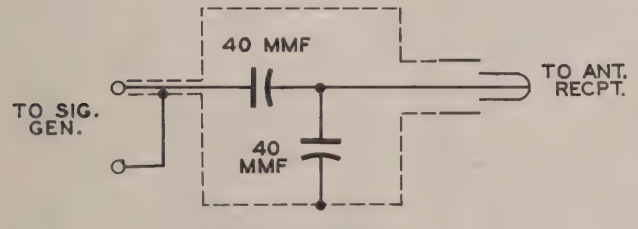


FIG. 1

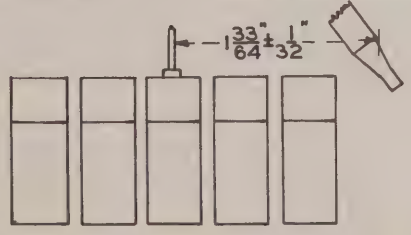


FIG. 2

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp	6AT6	6AT6	7BT	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■15	350	23A485677	AFH3-104		CO77		FP328	TVL-3630	
B	▲10	350								
C	20	25								
C2	90		21A591682							
C3	.006	100	8A4529	P488-006		PJ6D6	GP2-333-602	PT626	6TM-D6	
C4	.05	100	8K13514	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	.05	400	8R14791	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C6	5		21R115955	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C7	47		21R6513	SI47N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C8	100		21K502141							
C9	.006	100	8A4529	P488-006		PJ6D6	GP2-333-602	PT626	6TM-D6	
C10	.003	400	8R490437	P688-003	D6-302	PTE6D3	GP2-333-302	PT623	6TM-D3	
C11	.02	100	8R51209	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C12	.03	400	8K71911	P488-03		PTE6S3		PT413	4TM-S3	
C13	470		21R6531	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C14	.006	400	8K71910	P488-006		PJ6D6	GP2-333-602	PT626	6TM-D6	
C15	.02	1000	8K114137	P1088-02		PTE16S2		PT1612	MB-S2	
C16	.5	100	8C580845	P185-5		MP2P5			68P20	
C17	.5	100	8C580845	P185-5		MP2P5			68P20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	18B521099	QJ-435A *			UF16L	Tone-Panel
B	250KΩ	½					UR254-T753	Volume-Tapped ⓐ 75KΩ-Rear
C	Switch						US-26	Attach to R1B

* CONCENTRIKIT EQUIVALENT - KIT K-5, BASE ELEMENTS & SHAFTS, B11-137 & P1-210 (Panel), B18-130X & R1-226 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	470KΩ	½	6R6032	BTS-470K	
R3	100KΩ	½	6R6075	BTS-100K	
R4	33KΩ	½	6R6012	BTS-33K	
R5	82Ω	½		BTS-82	Note
R6	1Meg	½	6R6004	BTS-1Meg	
R7	6800Ω	2	6R490349	BTB-6800	
R8	47KΩ	½	6R6056	BTS-47K	
R9	12KΩ	½	6R6394	BTS-12K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R10	270Ω	½	6R6432	BTS-270	
R11	3.3Meg	½	6R2118	BTS-3.3Meg	
R12	470KΩ	½	6R6032	BTS-470K	
R13	470KΩ	½	6R6032	BTS-470K	
R14	220Ω	1	6R6389	BTA-220	
R15	1000Ω	2	6R46004	BTB-1000	
R16	56Ω	½	6R5614		
R17	56Ω	½	6R5614		

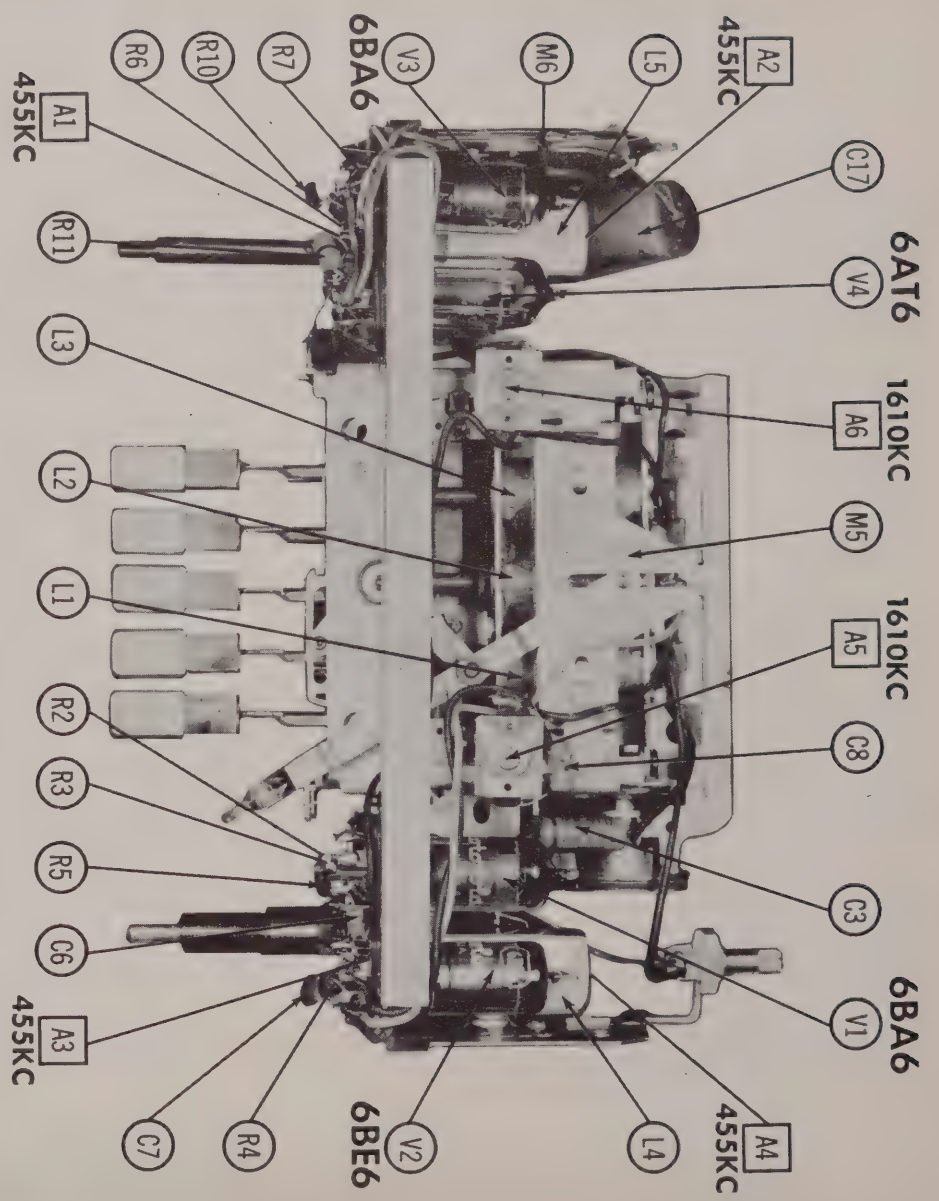
Note: Not used in all Models.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VAC ⓐ3.6A	480VCT .050ADC			25C501644		P-3068 ①	VT-2	

① Drill new mounting holes.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	5.3KΩ	3.6Ω	690Ω	3.6Ω	25B501684	A-3877 ①	A-3019 ①	RO-9 ①	S-3X ①	① Bend mounting tabs down, file out slots, mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6"x9"	6 Volt	3.6Ω	50K521403 50C510790 ① 50K512712 ① 50C521814 ② 50C502449 ② 50C501656 ② 50C521813 ②	ST-814 F69-T	69EV6	① Alternate 6 x 9" EM Speakers ② 6 x 9" PM Speakers

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	MOTOROLA PART No.	MILLER PART No.	
L1	Ant. Coil	7.5Ω		24B510507 *		Less core, core part #46A511658, used in Tuner Model AT-109 (Part #77D521085)
L2	RF Coil	7.5Ω		24B510508■		Less core, Core part #46A511658, used in Tuner Model AT-109
L3	Osc. Coil	.8Ω	2.9Ω	24B510506 †		Less core, core part #46A511658, used in Tuner Model AT-109
L4	Input IF	16Ω	16.5Ω	24B485553 ▲	12-C1	
L5	Output IF	17Ω	17Ω	24K485554	12-C6	
L6	Hash Choke	0Ω		24A472535	5221	15.2 Microhenries

* Tuner Model AT-108, part #77D520740 uses part #24B520111 in this application, less core (Core part #46K511937).
■ Tuner Model AT-108 uses part #24B520110 in this application, less core (Core part #46K511937)
† Tuner Model AT-108 uses part #24B520109 in this application, less core (Core part #46K511937)
▲ Alternate Part No. 24K502819.

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FRE-QUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Int.	6.3V	115∿	48B3333	5342	859	5342	

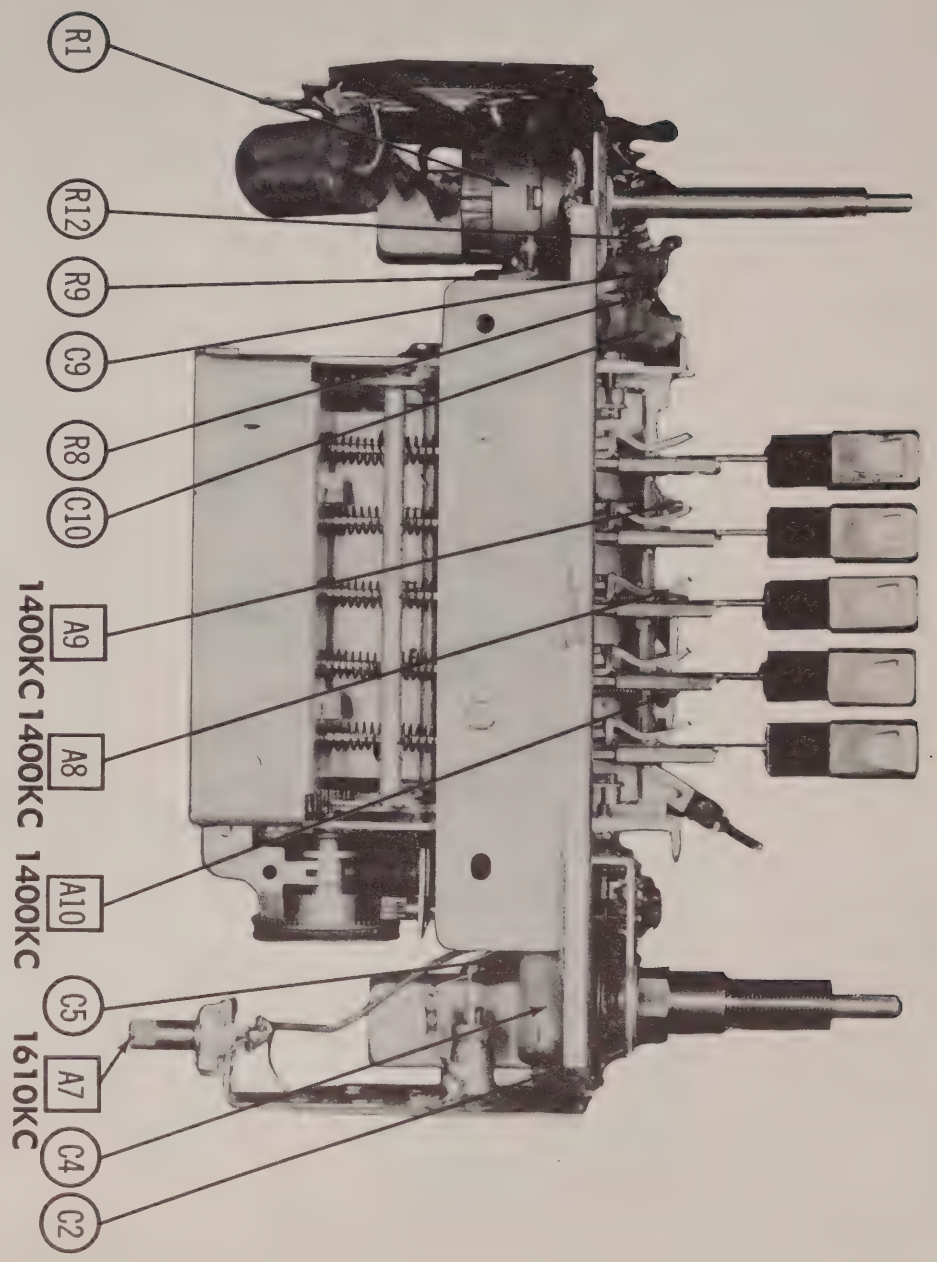
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A 32V	65K12894	9K512229	307014 (SFE-14A)	155014	SFE-14	HDI

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M3	Bayonet	6-8	.25	Blue	65X10867		Type #44
M4	Bayonet	6-8	.25	Blue	65X10867		Type #44

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M5A	Tuner, Model AT-109	77D521085	Complete.
B	Tuner, Model AT-108	77D520740	Complete.
M6	Spark Plate Assy.	1A512217	
A7	RF Trimmer Cap.	20B512238	Varible 50-280MMF.
	Knob	36K521221	Dummy, Round Hole
	Knob	36K521223	Tone Control Double "D" Hole.
	Knob	1V521191	Tuning or Volume Control.
	Pointer Arm Assy.	51K520735	Includes Clip for Tuner AT-108.
	Shaft and Bushing	51A520738	Manual Tuning Complete for Tuner AT-108.
	Shaft, Drive Disk and Pinion Assy.	51K511095	Manual Tuning Complete for Tuner AT-108.
	Spring, Pointer	41A501096	Anti Back Lash for Tuner AT-108.
	Clutch Drive Assy.	51A500995	Includes Friction Washers, Hub Crown Gear and Pinion Gear for Tuner AT-108.
	Clutch Drive Assy.	51B510922	Includes Friction Washers, Hub Crown Gear and Pinion Gear for Tuner AT-109.
	Pointer Arm Assy.	45B521071	For tuner AT-109.
	Shaft & Bushing Assembly	47B521069	Manual Tuning Complete for Tuner AT-109.
	Shaft, Drive Disk and Pinion Assembly	51K511580	
	Spring	41B510923	Pointer Anti Backlash For Tuner AT-109.

PUSHBUTTON ADJ:

Turn set on and turn up volume so stations can be heard.

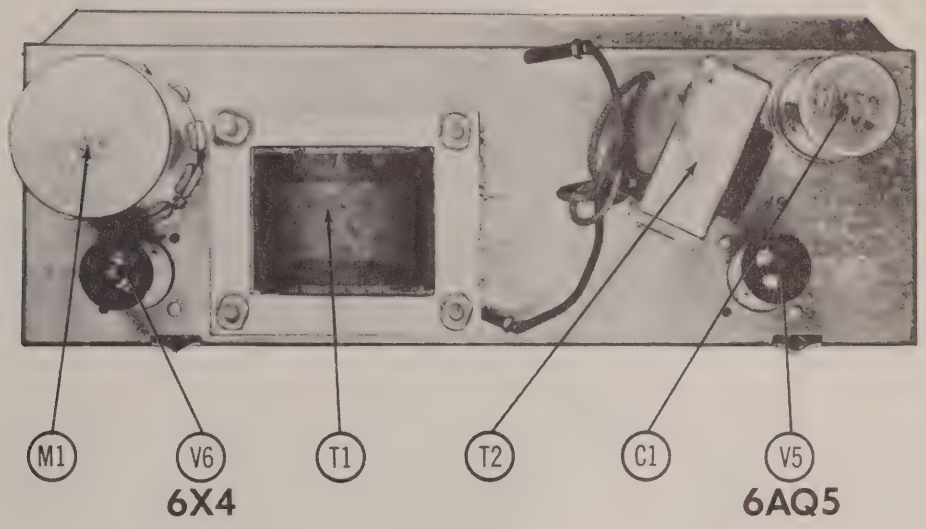
Pull out pushbutton.

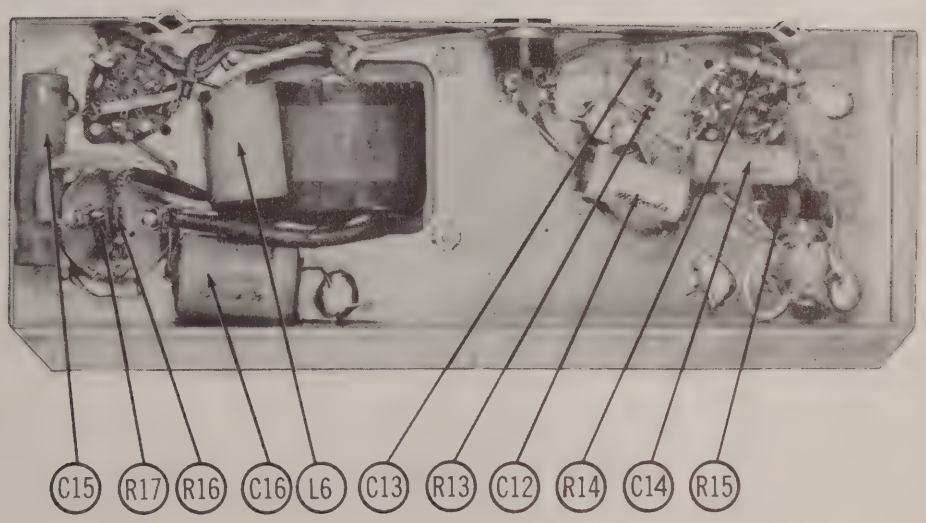
Turn manually to desired station signal.

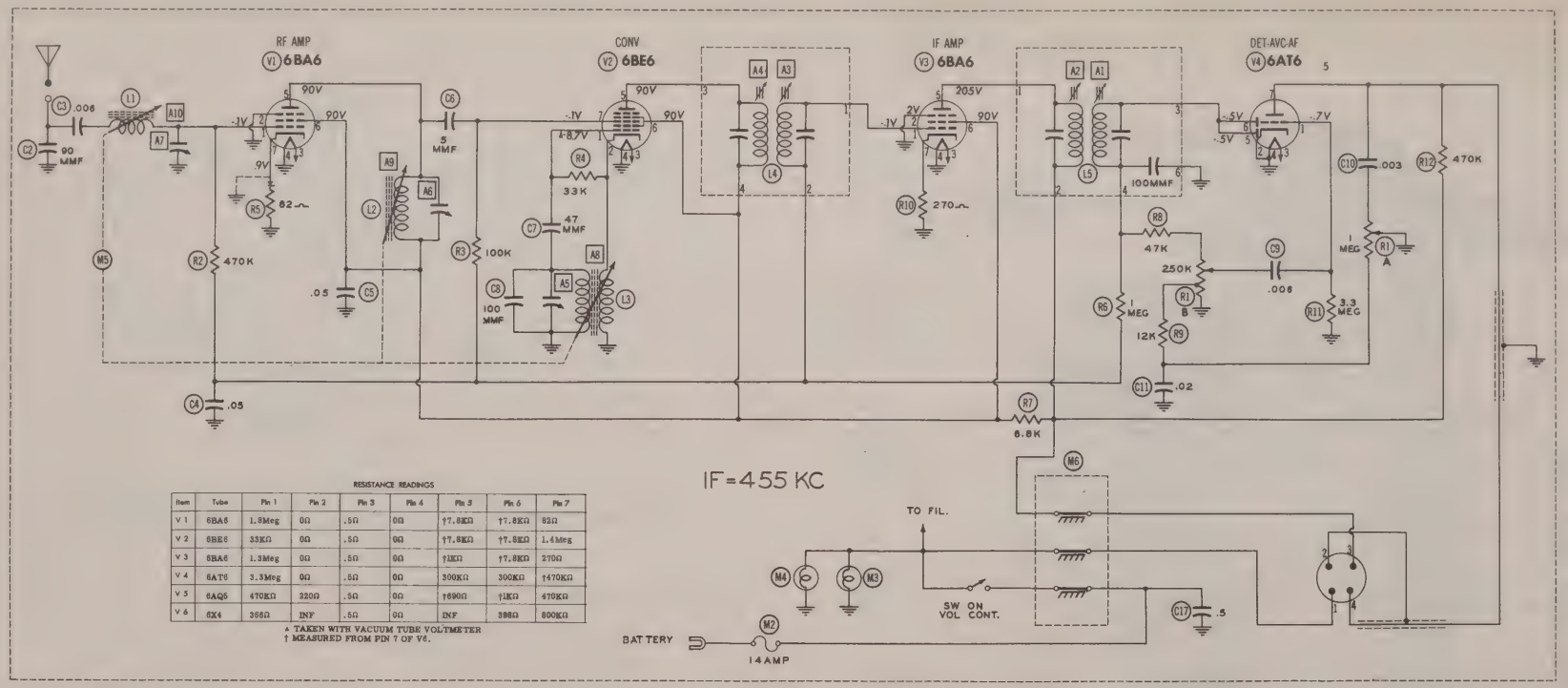
Push button fully in.

Repeat procedure for remaining pushbuttons.

PROPERTY OF
F. [illegible]SHIP
[illegible]
[illegible] COLORADO





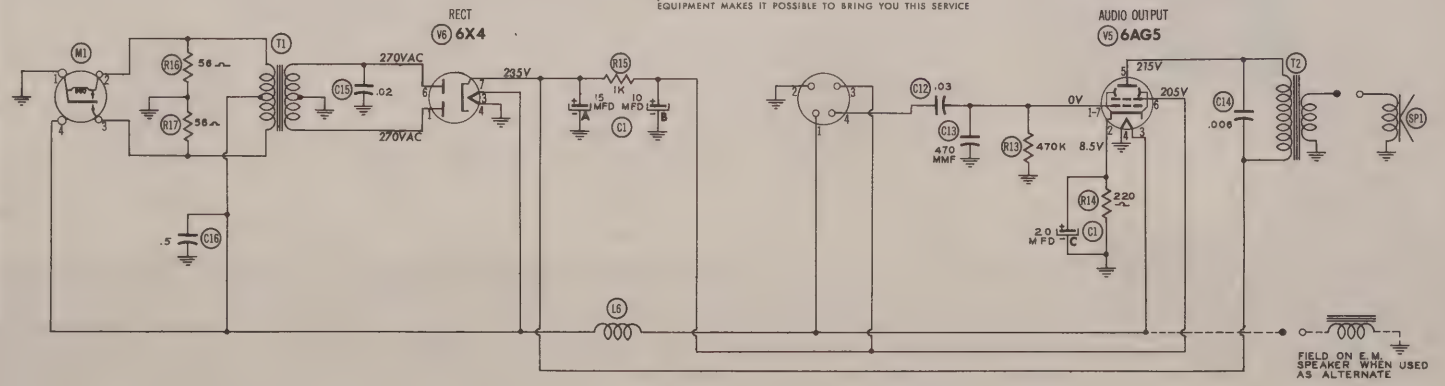


RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	1.8Meg	0Ω	.5Ω	0Ω	†7.8KΩ	†7.8KΩ	82Ω
V 2	6BE6	33KΩ	0Ω	.5Ω	0Ω	†7.8KΩ	†7.8KΩ	1.4Meg
V 3	6BA6	1.3Meg	0Ω	.5Ω	0Ω	†1KΩ	†7.8KΩ	270Ω
V 4	6AT6	3.3Meg	0Ω	.5Ω	0Ω	300KΩ	300KΩ	†470KΩ
V 5	6AQ5	470KΩ	220Ω	.5Ω	0Ω	†690Ω	†1KΩ	470KΩ
V 6	6X4	366Ω	INF	.5Ω	0Ω	INF	398Ω	800KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V6.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connnections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

PHILCO MODELS 53-T1824, 1825, 1826, 1852, F, L, 1854, L, 2124, L, 2125, L, 2126, 2152, L, 2226, 2227, 2255, L (Codes 123 & 133), 2260, 2262, 2264, 2272, L (Ch. H1 & 81)

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MODEL 53-T2124

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DATE 4-53 SET 201 FOLDER 7

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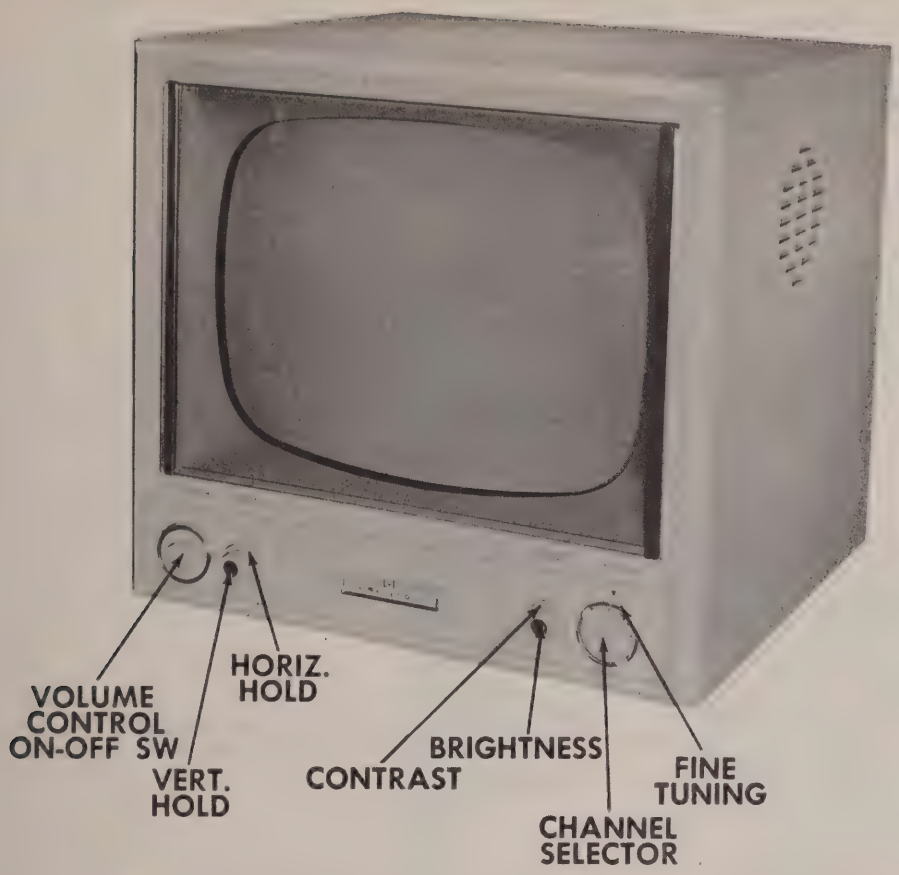

PHILCO MODELS 53-T1824, 1825, 1826, 1852, F, L, 1854, L, 2124, L, 2125, L, 2126, 2152, L, 2226, 2227, 2255, L (Codes 123 & 133), 2260, 2262, 2264, 2272, L (Ch. H1 & 81)

PHILCO MODEL 53-T2124

TRADE NAME	Philco Models 53-T1824, -T1825, -T1826, -T1852, F, L, -T1854, L, -T2124, L, -T2125, L, -T2126, -T2152, L, 53-T2226, -T2227 (Code 123) 53-T2255, L (Code 133) 53-T2260, -T2262, -T2264, -T2272, L, (Code 123) Sweep Ch. H1, RF IF Ch. 81.
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pennsylvania
TYPE SET	Television Receiver
TUBES	Eighteen
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.5 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 26.6MC, Sound IF 22.1MC (Intercarrier).

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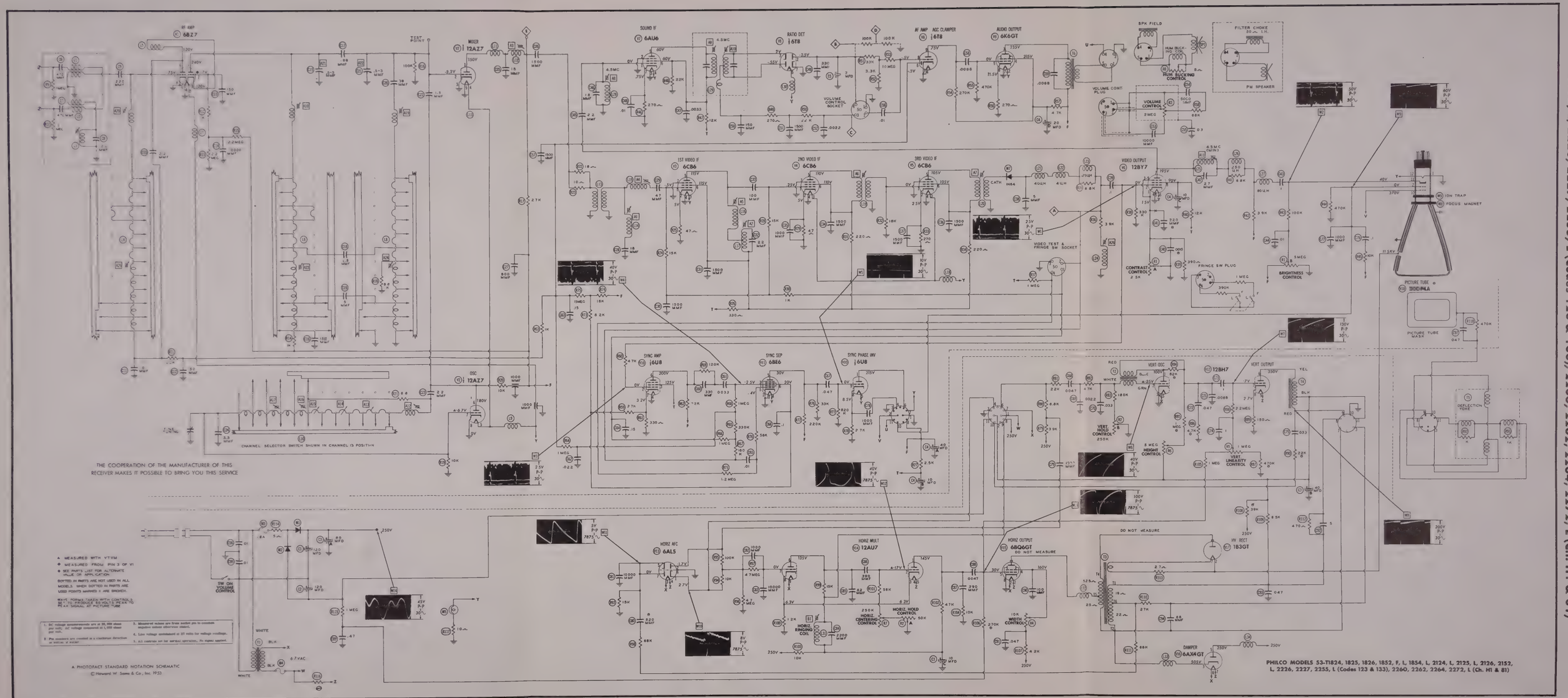
RF AMP V1 6BZ7
MIXER V2 12AZ7
OSC V3 12AZ7
SOUND IF V4 6AU6
RATIO DET V5 6T8
AF AMP AGC CLAMPER V6 6T8
AUDIO OUTPUT V7 6K6GT
1ST VIDEO IF V1 6CB6
2ND VIDEO IF V8 6CB6
3RD VIDEO IF V9 6CB6
VIDEO OUTPUT V6 12BY7
SYNC AMP V10 6U8
SYNC SEP V11 6BE6
SYNC PHASE INV V10 6U8
HORIZ AFC V13 6AL5
HORIZ MULT V14 12AU7
HORIZ OUTPUT V15 6BQ6GT DO NOT MEASURE
VERT OSC V16 12BH7
VERT OUTPUT V17 12BH7
HV RECT V17 1B3GT
DAMPER V18 6AX4GT
PICTURE TUBE V19 21DEP4A
PICTURE TUBE MASK
DEFLECTION YOKE
ION TRAP
FOCUS MAGNET
PM SPEAKER
FILTER CHOKE 30 HY. 1 H.
5PK FIELD
HUM BUCKING COIL
HUM BUCKING CONTROL
VOLUME CONTROL
VOLUME CONT. PLUG
VOLUME CONTROL SOCKET
CONTRAST CONTROL
BRIGHTNESS CONTROL
FRINGE SW PLUG
VIDEO TEST & FRINGE SW SOCKET
HORIZ. RINGING COIL
HORIZ CENTERING CONTROL
HORIZ. HOLD CONTROL
WIDTH CONTROL
VERT HOLD CONTROL
HEIGHT CONTROL
VERT LINEARITY CONTROL
SW. ON VOLUME CONTROL
TEST POINT
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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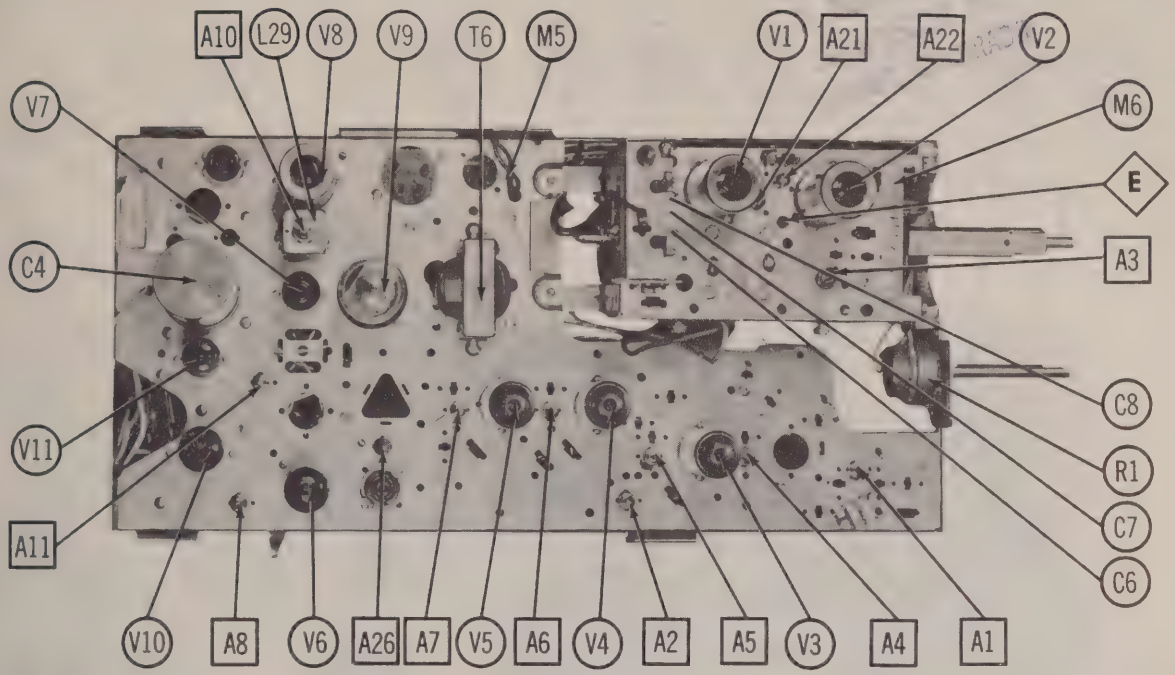
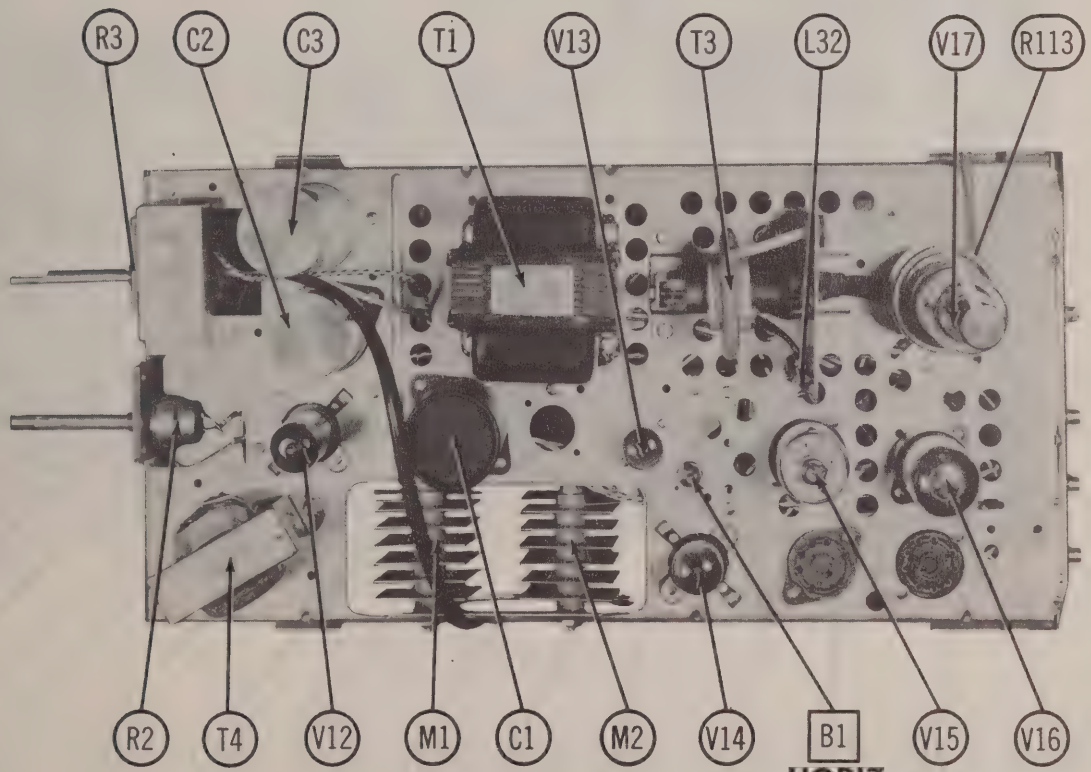
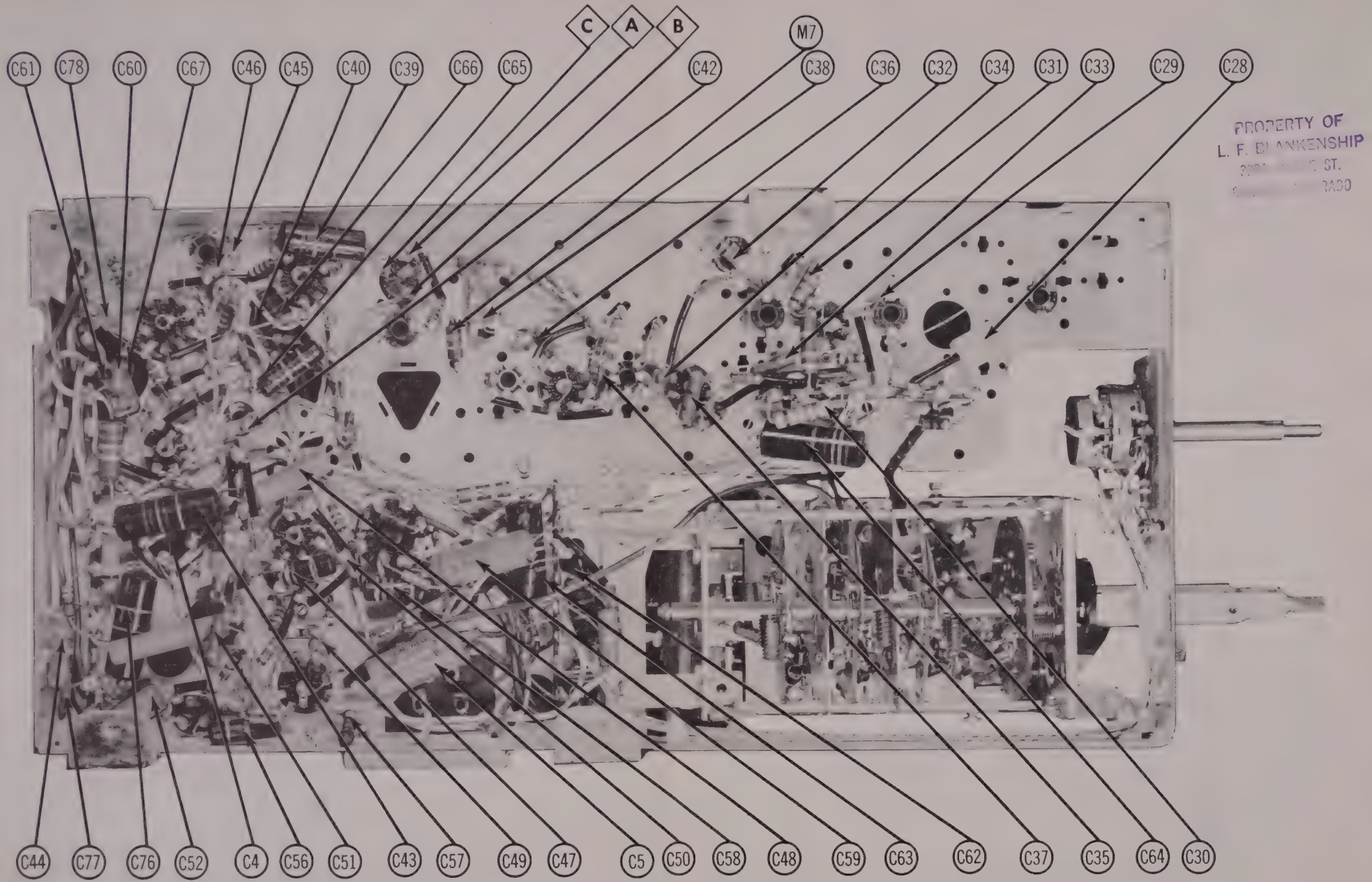


RF-IF CHASSIS-TOP VIEW



SWEEP CHASSIS-TOP VIEW



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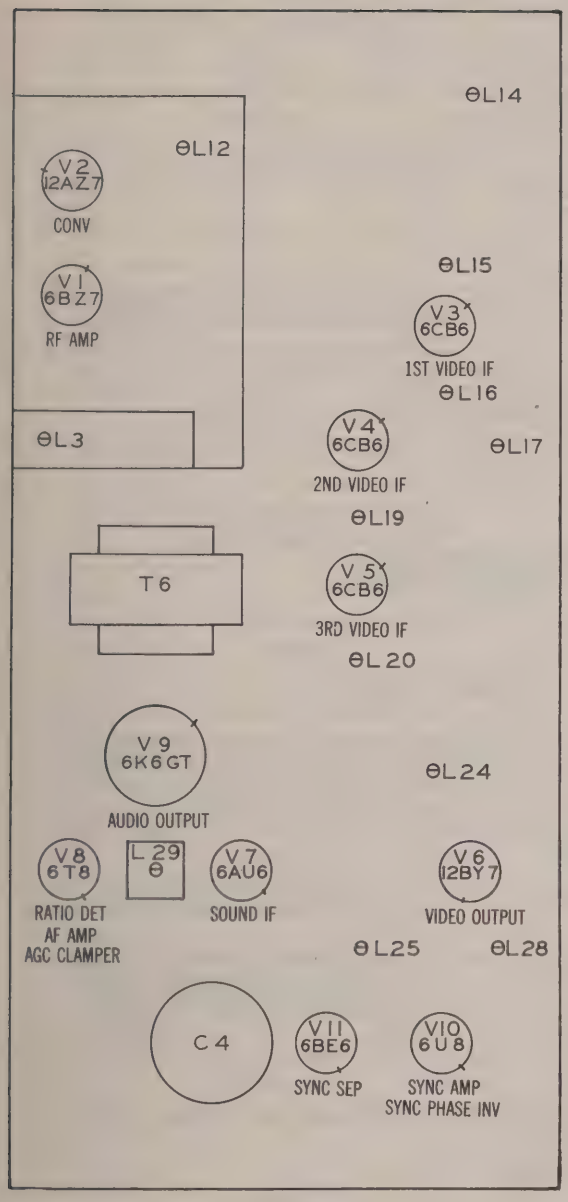
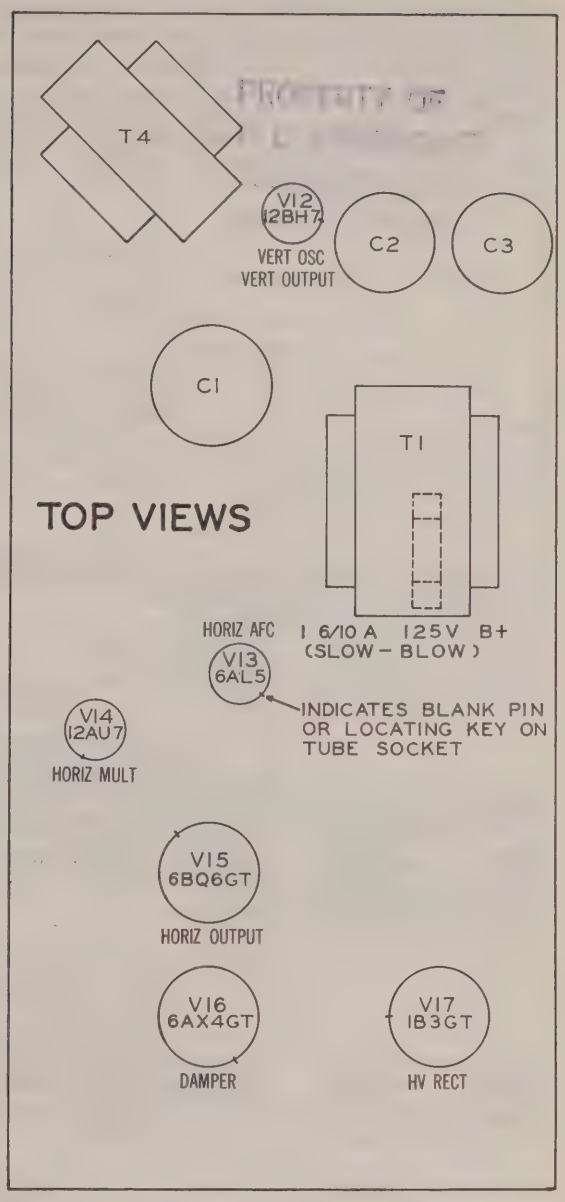
RF-IF CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART





TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound- Selenium Rectifiers (M1 & M2), Fuse (M3)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V6, V18
Has pic, no sound- V7, V8, V9
Overloaded picture-V8

SYNC FAILURE
No vert. sync.-V10, V12
No horiz. sync.-V10, V13, V14
No vert. or horiz. sync.-V10, V11

SWEEP FAILURE
No raster, has sound-V14, V15, V16, V17
No vertical deflection-V12
Poor vert. linearity or foldover-V12
Poor horiz. linearity or foldover-V14, V15, V16
Narrow picture-V14, V15, V16, V17, M1, M2
Vert. off freq.-V10, V12
Horiz. off freq.-V10, V13, V14

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage. Use an isolation transformer to protect the test equipment.

VIDEO IF ALIGNMENT

Set the contrast and brightness controls at maximum counter clockwise rotation.
The IF shield must be in place during alignment.
Connect the negative lead of a 3 volt battery to pin 1 of the Video Test and Fringe Switch socket.
Connect the positive lead to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V2) Low side to chassis.	Not used.	28.1MC (400∿Mod)	4	Vert. amp. thru 10KΩ to point ◇A (Pin 2) of Video Test jack. Low side to chassis.	A1	Adjust for MINIMUM 400∿ indication on scope.
2.	"	"	"	22.1MC	"	"	A2	"
3.	"	"	"	24.0MC	"	"	A3	Adjust for maximum 400∿ indication on scope Attenuate generator output to generator output to maintain .6Volt or less peak to peak on scope.
4.	"	"	"	25.7MC	"	"	A4	"
5.	"	"	"	23.6MC	"	"	A5	"
6.	"	"	"	26.4MC	"	"	A6	"
7.	"	"	"	24.5MC	"	"	A7	"
8.	"	"	24 MC (10MC Swp)	23.6MC 26.6MC	"	"		Check for response curve within the limits as shown in Fig. 1. If necessary retouch A3 thru A7 slightly for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point B to chassis. The junction of these two resistors is alignment point D as shown on the schematic.
Remove the 1st. Video IF tube (V3) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to point ◇A Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point ◇B Common to chassis.	A8, A9	Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point ◇C Common to point ◇D	A10	Adjust for a zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove the 1st. Video IF tube (V3) from its socket.
Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.01MFD	High side to point ◇A Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp to point ◇B Low side to chassis.	A8, A9	Disconnect stabilizer capacitor C5. Adjust for curve of maximum amplitude and symmetry.
10.	"	"	"	"	"	Vert. amp. to point ◇C Low side to chassis.	A10	Reconnect capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	.01MFD	High side to point A Low side to chassis.	Not used.	4.5MC (400∿Mod)	Any	Vert. amp thru detector (Fig. 4) to pin 11 of picture tube. Low side to chassis.	A11	Adjust for MINIMUM 400∿ indication on scope.

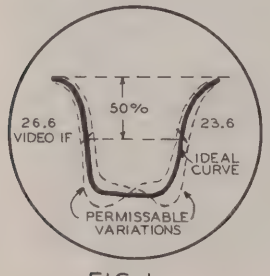


FIG. 1

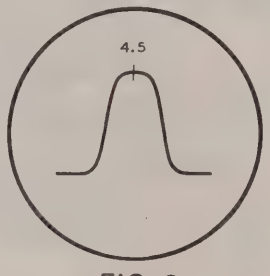


FIG. 2

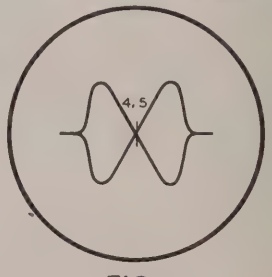


FIG. 3

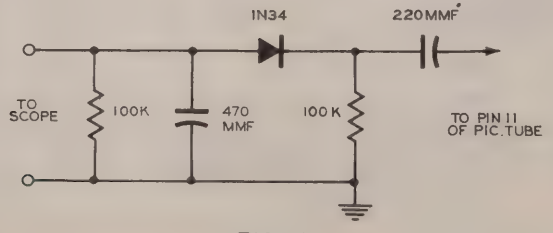


FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT

Preset the fine tuning so that the stop on the fine tuning cam lies between Channels 7 and 8 holes on the front plate of the tuner.
If tuner is being aligned out of the chassis connect the negative lead of a 1.5 volt battery to the white (AGC) lead of the tuner.
Connect the positive lead to tuner chassis.

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	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Direct	Across antenna terminals.	Not used	237.85MC 225.85MC 213.85MC	13 11 9	Vert. Amp. thru 1000Ω to point (E). Low side to chassis.	A12 A13 A14	Adjust for zero beat indication on scope. High scope gain may be necessary.
13	Repeat step 12 until channels 13, 11 and 9 are within ± 500KC of correct frequency.							
14.	Direct	Across antenna terminals.	Not used	201.85MC 109.85MC 93.85MC	7 6 4	Vert. Amp. thru 1000Ω to point (E). Low side to chassis.	A15 A16 A17	Adjust for zero beat indication on scope.

RF ALIGNMENT

Disconnect the tuner coupling link to the IF section and terminate the link with a 40 - 70Ω resistor.
Disconnect the white (AGC) lead from the tuner and connect it to the negative lead of a 1.5 volt battery. Connect the positive battery lead to chassis.
Connect the syncrhonized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 213.0MC 215.75MC	13	Vert. amp. thru 1000Ω to point (B) Low side to chassis.	A18, A19, A20	Adjust A18 and A19 for a symmetrical, approximately centered response curve. Detune A19 until a single peak occurs. Adjust A18 to place 213MC at peak. Adjust A20 for maximum height and symmetry of single peak. Readjust A18 and A19 for response similar to Fig. 5.
16.	"	"	177MC (10MC Swp)	175.25MC 177.0MC 179.75MC	7	"	A21, A22	Check for symmetrical, centered response curve. If response is unbalanced as in Fig. 6A adjust A21 and A22 for response that is a mirror image of original, as in Fig. 6B. This over compensation is to allow for subsequent adjustment on channel 13.
17.	"	"	213MC (10MC Swp)	211.25MC 213.0MC 215.75MC	13	"		Readjust A18 and A19 for response similar to Fig. 5.
18.	Repeat steps 16 and 17 until most symmetrical and centered response curves are obtained on channels 13 and 7.							
19.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	85MC (10MC Swp)	83.25MC 85.0MC 87.75MC	6	Vert. amp thru 1000Ω to point (E) Low side to chassis.	A23, A24 A25	Adjust A23 and A24 for a symmetrical, approximately centered response curve. Detune A25 counter-clockwise until a single peak occurs. CAUTION: Do not turn A25 excessively or it will fall out of the coil. Adjust A23 to place 85MC at peak response. Adjust A25 for maximum height and symmetry of single peak. Readjust A23 and A24 for a symmetrical response with center at 85MC.

VIDEO DETECTOR PEAKING COIL ADJUSTMENT

This coil has been properly aligned at the factory and ordinarily will require no further adjustment. On some stations, however, where excessive overshoot or smear is present adjustment of A26 may improve the picture at the possible sacrifice of quality on other stations. Adjust A26 for least smear or trailing whites, then check other channels to see that they have not been seriously affected.
Tuner and IF alignment must be correct before adjustment of A26 is made.

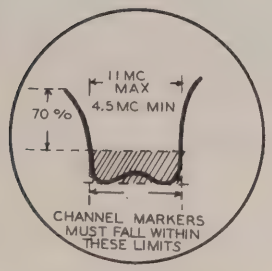


FIG. 5

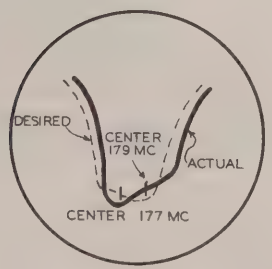


FIG. 6A ORIGINAL

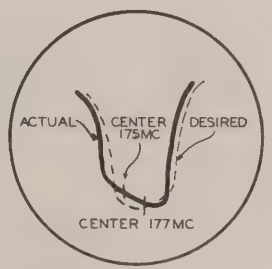


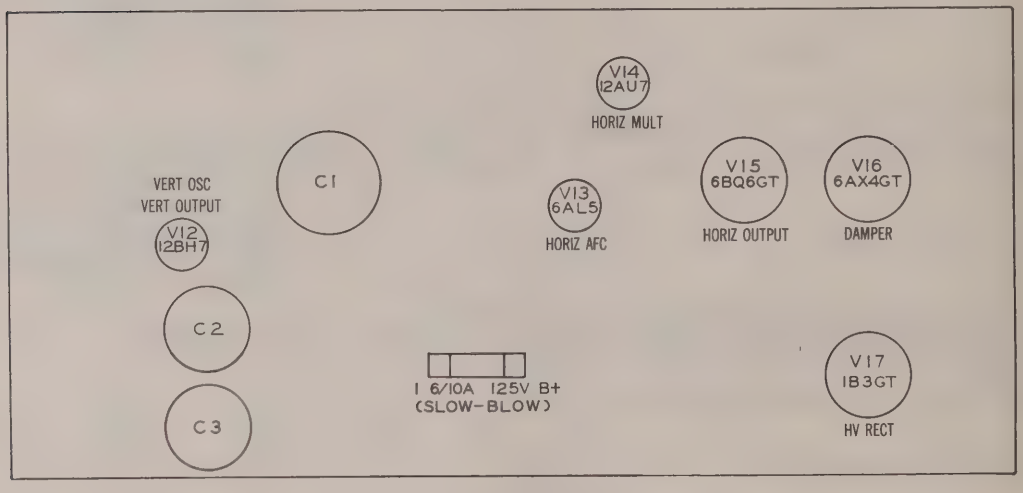
FIG. 6B COMPENSATED

PHILCO MODELS 53-T1824, 1825, 1826, 1852, F, L, 1854, L, 2124, L, 2125, L, 2126, 2152, L, 2226, 2227, 2255, L (Codes 123 & 133), 226O, 2262, 2264, 2272, L (Ch. H1 & 81)

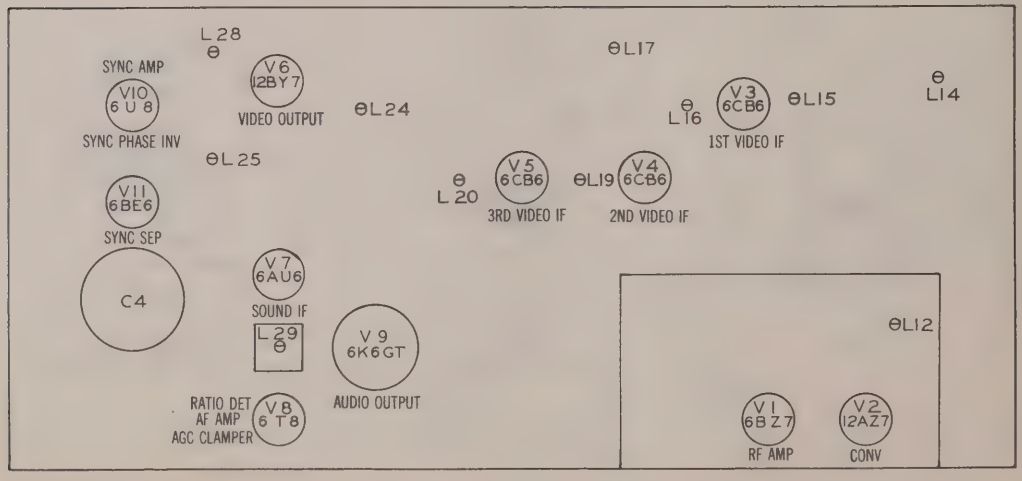
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	†1KΩ	†1.1Meg	INF	0Ω	.1Ω	INF	1.5Meg	0Ω	0Ω
V 2	12AZ7	†27KΩ	100KΩ	0Ω	.1Ω	.1Ω	†10KΩ	10KΩ	0Ω	0Ω
V 3	6CB6	1.2Meg	47Ω	.1Ω	0Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 4	6CB6	1.2Meg	47Ω	.1Ω	0Ω	†3KΩ	†3KΩ	0Ω		
V 5	6CB6	.3Ω	270Ω	.1Ω	0Ω	†3KΩ	†3KΩ	0Ω		
V 6	12BY7	85Ω	330KΩ	0Ω	0Ω	0Ω	.1Ω	†3.9KΩ	14KΩ	0Ω
V 7	6AU6	4.1Ω	0Ω	0Ω	.1Ω	†11KΩ	†11KΩ	270Ω		
V 8	6T8	INF	36KΩ	INF	0Ω	.1Ω	1.5Meg	0Ω	10 Meg	†275KΩ
V 9	6K6GT	5Ω	.1Ω	†475Ω	†4.7KΩ	470KΩ	†0Ω	0Ω	270Ω	
V 10	6U8	†10.7KΩ	330KΩ	†2.5KΩ	0Ω	.1Ω	†22KΩ	330Ω	2.7KΩ	820KΩ
V 11	6BE6	2.3Meg	0Ω	0Ω	.1Ω	†40KΩ	†14KΩ	1.5Meg		
V 12	12BH7	■1.7Meg	300KΩ	0Ω	.1Ω	.1Ω	■8KΩ	2.8Meg	150Ω	.2Ω
V 13	6AL5	4.8Meg	4.8Meg	.1Ω	.2Ω	15KΩ	INF	15KΩ		
V 14	12AU7	†57KΩ	120KΩ	1.2KΩ	.2Ω	.2Ω	†25KΩ	9.5Meg	1.2KΩ	.1Ω
V 15	6BQ6GT	750KΩ	.1Ω	INF	†10KΩ	800KΩ	680KΩ	.2Ω	0Ω	Top Cap ■29Ω
V 16	6AX4GT	†0Ω	INF	60KΩ	INF	†1.8KΩ	490KΩ	.2Ω	.1Ω	
V 17	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap ■554Ω
V 18	20DP4A	0Ω	470KΩ	Pin 10 ■6.5KΩ	Pin 11 470KΩ	Pin 12 .1Ω				

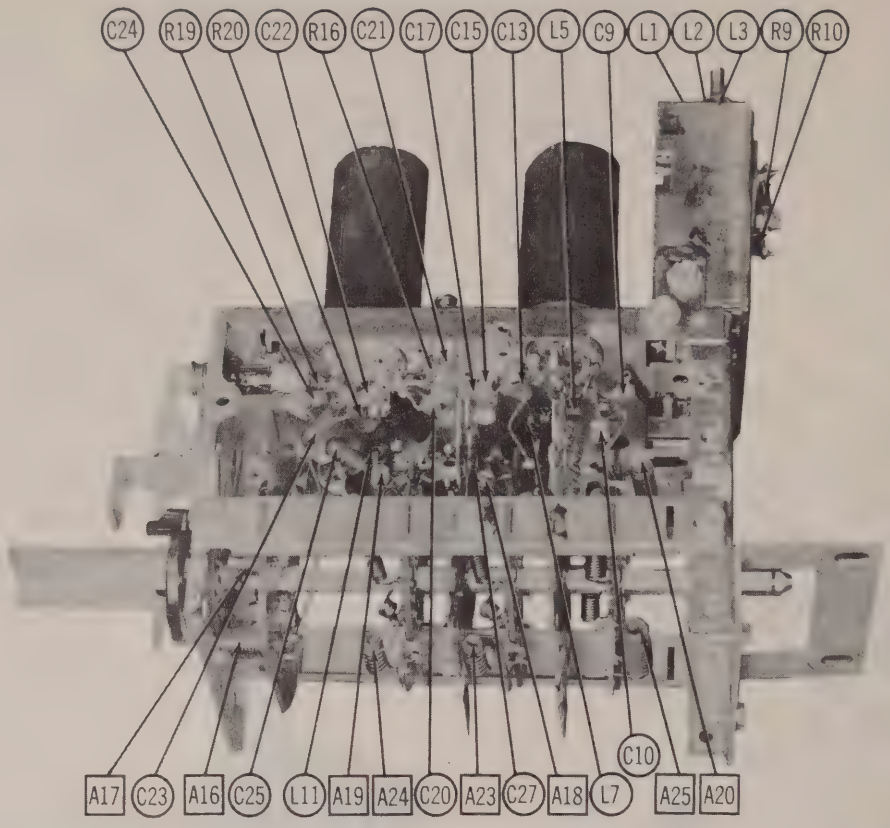
† MEASURED FROM OUTPUT OF M1 .
■ MEASURED FROM PIN 3 OF V16.



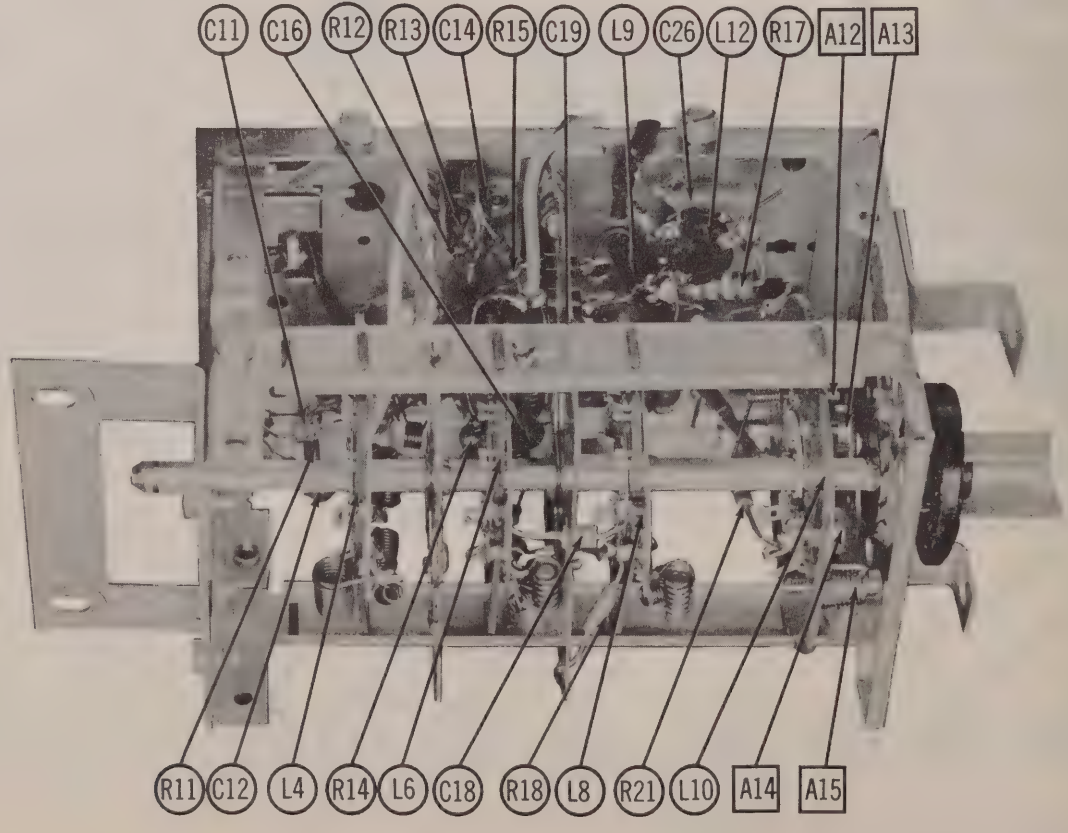
BOTTOM VIEWS



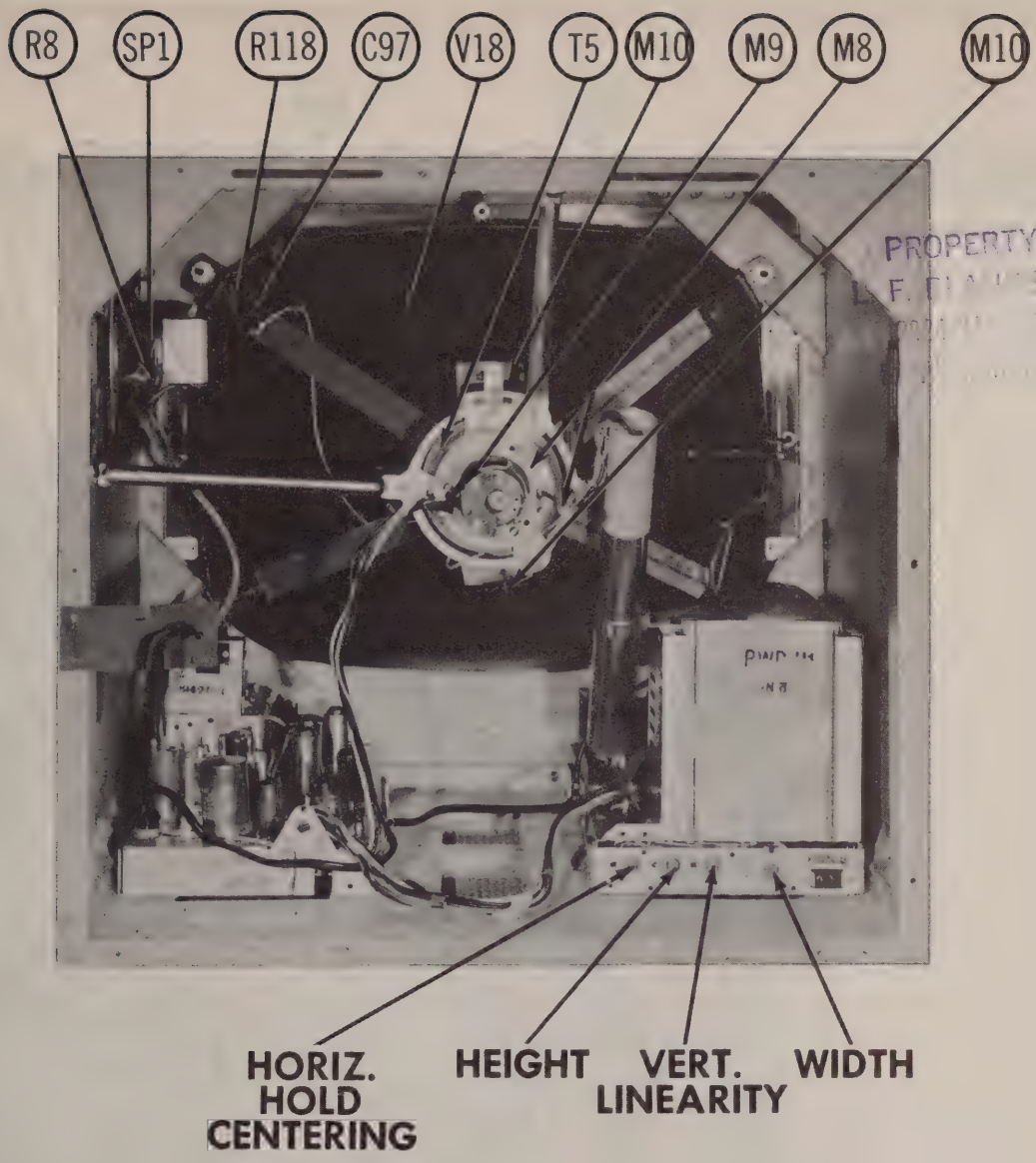
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



PROPERTY OF

CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Reduce the picture width to obtain approximately 1 inch of blank screen on right hand and left hand side of picture.

Increase the picture brightness until the blanking becomes visible as a dark vertical bar on each side of picture.

Connect a .1MFD capacitor from pin 9 of chassis connecting power socket to chassis (junction of horizontal oscillator coil and 15KΩ plate resistor of V14).

Set horizontal hold control to mid-position of its range.

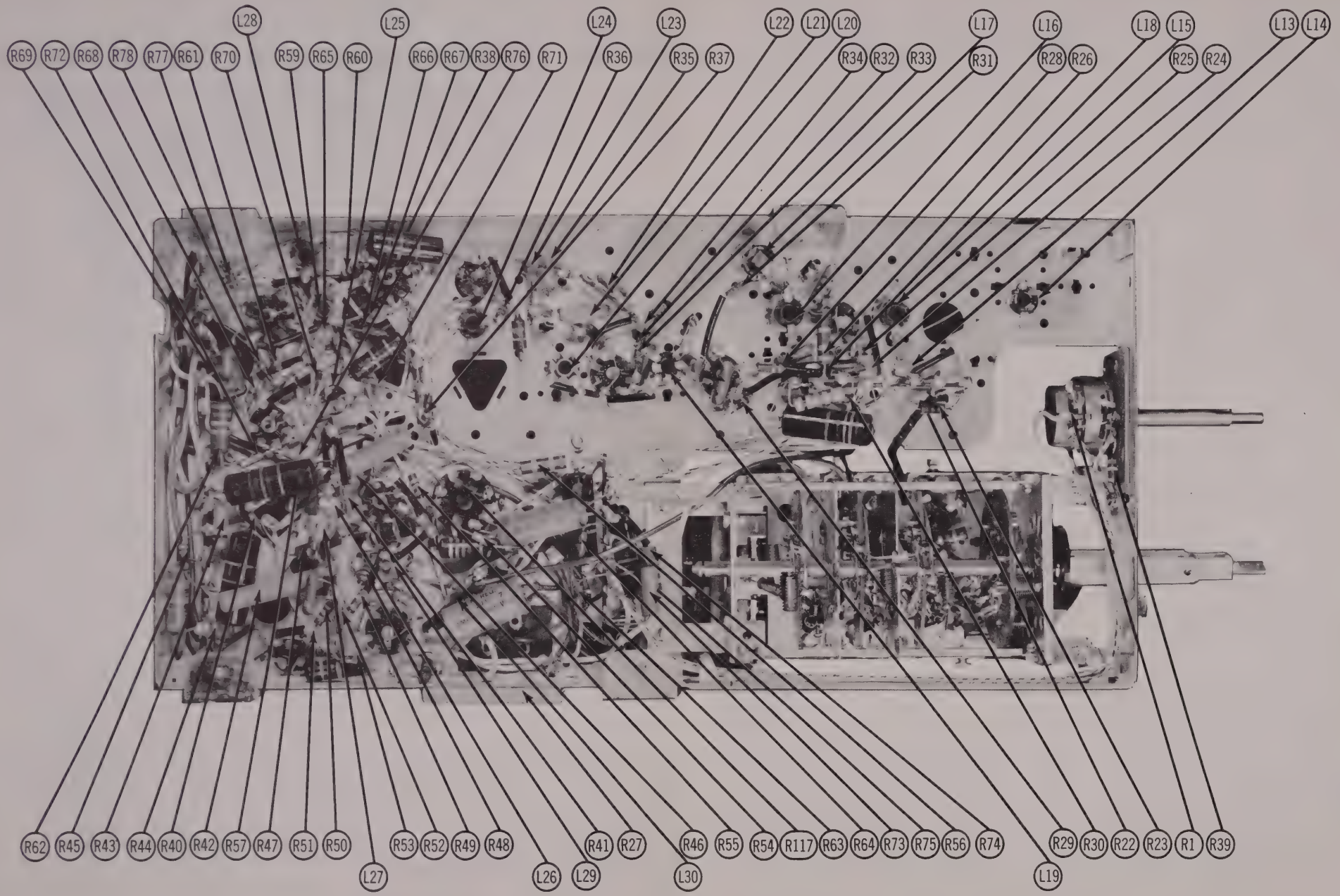
Adjust the horizontal hold centering control for equal blanking bars at each end of picture. Remove the .1 capacitor.

Adjust the horizontal ringing coil slug (B1) for equal portions of blanking bar at both sides of picture.

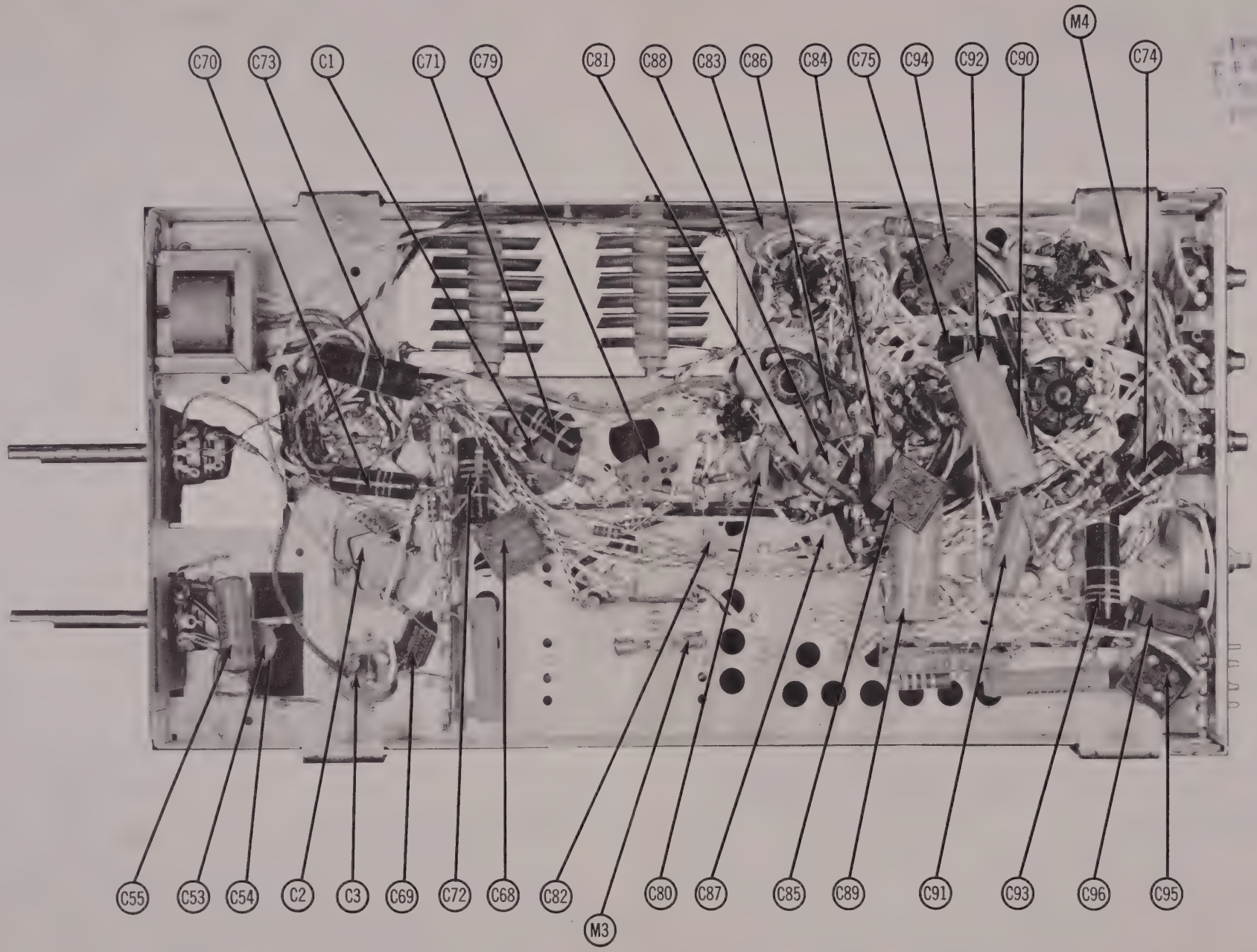
Check the centering of the range of the horizontal hold control, if necessary, making slight readjustment of the horizontal centering control for best centering.

Rotate the horizontal hold control throughout its range and note the least number of bars just before sync pull in. There should be 1 or 2 bars. If proper sync pull in is not obtained repeat above procedure.

Reset width control for proper picture width.



RF-IF CHASSIS-BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATON



SWEEP CHASSIS-CAPACITOR AND ALIGNMENT IDENTIFICATION

TROUBLE SHOOTING AIDS

AC LINE ISOLATION

CAUTION

Both sides of the AC line are connected to the chassis through branches of the voltage doubler network. Grounding the chassis will result in a direct short across C2 and the speaker field in series or R114, C3 and M1 in series, resulting in possible damage to the receiver.

A line isolation transformer of at least 225 watts rating should be used. Failure to use a line isolation transformer greatly increases the shock hazard and may result in damage to the test equipment and/or receiver.

SWEEP

HORIZONTAL

INSUFFICIENT SWEEP:

Substitute V14, V15 and V16. Check setting of width control. Check waveform at W12.

If Satisfactory	If Unsatisfactory
Check T3, C93 and C92. Check yoke	Check C88, C87 and other components of the horizontal oscillator and coupling circuits.

DRIVE LINES:

Substitute V15 and V16. Check C87 and C88. Check components associated with V16. Check T3.

COMPRESSED AT LEFT SIDE:

Substitute V15 and V16. Check C90 and C91. Check damper circuit components.

FOLDS:

Substitute V14, V15 and V16. Check waveform at W12.

If Satisfactory	If Unsatisfactory
Check T3 and other components of the horizontal output stage.	Check horizontal oscillator and coupling circuit.

PIE CRUST EFFECT:

This is the jagged effect of the outer edges of the test pattern, as shown in Figure I. It is caused by C83 being open.

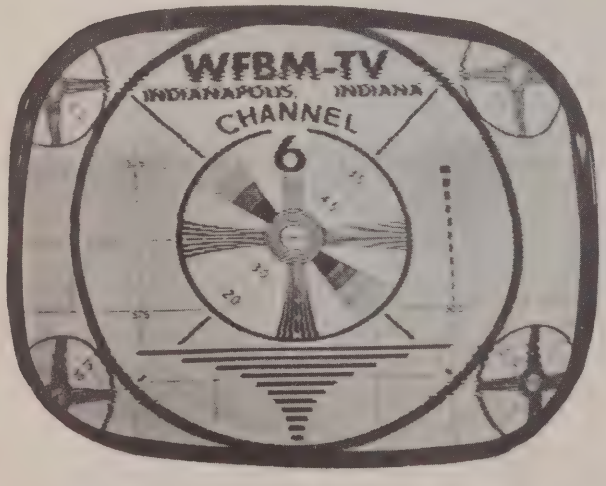


Fig. 1

VERTICAL

LOSS OF SWEEP:

Substitute V12. Check waveform at W7.

If Satisfactory	If Unsatisfactory
Check T4, R89 and yoke.	Check C73, T2 and C68. Check other components associated with V12A.

INSUFFICIENT SWEEP

Substitute V12. Check C91 for leakage. Proceed as outlined under LOSS OF SWEEP.

COMPRESSED AT BOTTOM:

Check setting of the height and vertical linearity controls. Substitute V12. Check T4 and C3B.

COMPRESSED AT TOP:

Substitute V12. Check C74.

WILD VERTICAL OSCILLATOR:

This condition, as illustrated in Figure II, is caused by open vertical waveshaping capacitor C72.

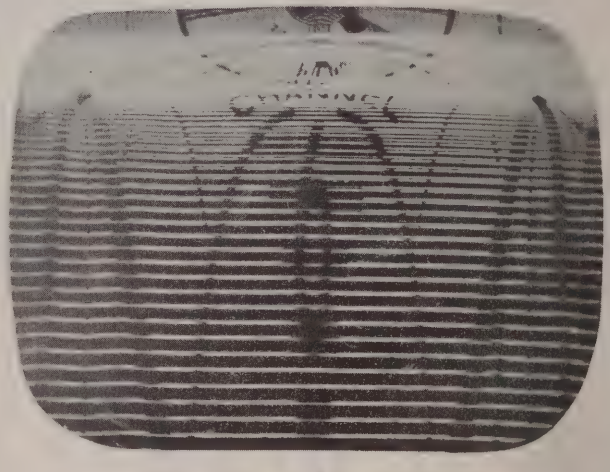


Fig. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	12AZ7	12AZ7	9A	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	12BY7	12BY7	9BF	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Detector-AF Amplifier-AGC Clamper	6T8	6T8	9E	
V9	Audio Output	6K6GT	6K6GT	7S	
V10	Sync Amplifier-Sync Phase Inv.	6U8	6U8	9-AE	
V11	Sync Separator	6BE6	6BE6	7CH	
V12	Vert. Oscillator-Vert. Output	12BH7	12BH7	9A	
V13	Horiz. AFC	6AL5	6AL5	6BT	
V14	Horiz. Mult.	12AU7	12AU7	9A	
V15	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V16	Damper	6AX4GT	6AX4GT	4CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA			RTMA BASE TYPE	NOTES
	PHILCO PART No.	SYLVANIA PART No.			
V18A	20DP4A	20DP4A		12D	① Circuit changes necessary
		20DP4 ①		12D	② 3/8" shorter
		20CP4A ②		12D	
		20CP4 ① ②		12D	
		20HP4 ①		12C	
		20HP4A ①		12C	
		20LP4		12C	
B	21EP4A			12D	
C	17YP4			12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	120	150	30-2568-51	AFHS1-71		XA007		FP140	TVL-1580	
C2	120	150	30-2568-51	AFHS1-71		XA007		FP140	TVL-1580	
C3A	■80	300	30-2584-20	AFH3-46		CO37		FP378	TVL-3806	
B	▲40	475								
C	▲10	300								
C4A	▲40	300	30-2570-57	AFH4-18		D111		FP476	TVL-4840	
B	▲10	300								
C	10	300								
D	■20	300								
C5	2	50	30-2417-7	E26E6		BBR-2-50T		TC302	TVA-1301	
C6	470		30-1225-18	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C7	470		30-1225-18	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C8	20		62-020309011	SI20	D6-200		GP1K-200	UC-542	5GA-Q2	
C9	220		62-122001001	SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C10	2.2		30-1221-6		TCZ-2.2		NP0K-2R2		5TCCB-V22	
C11	10		62-010409001	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C12	150		62-115001011	SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C13	150		62-115001011	SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C14	10000		30-1238-2	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C15	.5-3		31-6520-3		829-3			CT565A		
C16	150		62-115001011	BPD-00015	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C17	.68				TCZ-.68		NP0K-R68			
C18	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C19	5			SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C20	39		62-03940911	SI39	D6-390		GP1K-390	UC-5439	5GA-Q39	
C21	.5-3		31-6520-3		829-3			CT565A		
C22	1.5		30-1221-8	SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C23	2.2		62-022009001							
C24	3.3		30-1224-30							
C25	15		62-01540911	SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C26	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C27	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C28	18	500	62-018400021							
C29	47			SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C30	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C31	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C32	22		62-022009001	SI22	D6-220		GP1K-220	UC-5422	5GA-Q22	
C33	100		62-110409001	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C34	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C35	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C36	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C37	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C38	5		30-1224-5	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C39	.1	200		P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C40	.0015	400		P688-0015	D6-152	PTE6D15	GP2L-152	PT6215	6TM-D15	Note 1
C41	220			SI220	D6-221		GP2K-221	UC-5322	5GA-T22	Note 2
C42	27		62-027409011	SI27	D6-270		GP1K-270	UC-5427	5GA-Q27	
C43	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C44	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C45	2.2		30-1221-6		TCZ-2.2		NP0K-2R2		5TCCB-V22	
C46	18		62-018400021	SI18	D6-180	5R5Q2	GP1K-180	UC-5418	5GA-Q18	
C47	.0033	400		P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D3	
C48	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C49	330		62-133001001	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C50	150		62-115001011	SI150	D6-151	TM5T15	GP2K-151	UC-5315	5GA-T15	
C51	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C52	.0022	400		P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C53	10000			BPD-01	DD-103	TM5S1	621-01	DC-511	5HK-S1	
C54	5000			BPD-005	DD-502	TM5D5	611-005	DC-525	5HK-D5	
C55	.03	400		P688-03		PTE6S3		PT413	6TM-S3	
C56	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C57	1500			SD500	D6-153	TM5D15	GP2L-152	UC-5215	5HK-D15	
C58	.0068	400		P488-0068	D6-682	PTE6D68	GP2-333-682		6TM-D68	
C59	.0068	1000	45-3505-91	P1088-0068		PTE16D68			MB-D68	
C60	330		62-133001001	S1330	D6-331		GP2K-331	UC-5333	5GA-T33	
C61	.0033	400		P688-0033	D6-332	PTE6D33	GP2-333-332	PT6333	6TM-D3	
C62	.022	200		P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C63	.15	200		P288-15		PTE4P15		TP417	2TM-P15	
C64	.15	200		P288-15		PTE4P15		TP417	2TM-P15	
C65	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C66	.1	200		P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C67	.047	200		P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C68	.0047	600		P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C69	.0022	400		P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C70	.033	200		P488-033		PTE6S3		PT4133	6TM-S3	
C71	.0068	400		P488-0068		PTE6D68			6TM-D68	
C72	.047	400		P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C73	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C74	.1	200		P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C75	.033	400		P488-033		PTE6S3		PT4133	6TM-S3	
C76	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C77	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C78	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C79	1000	500		1468-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C80	820	500								Note 1
C81	10000	500		1441WX-01		1D3S1		MC475	1FM-11	
C82	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C83	10000			BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C84	2200	500								
C85	82	500	80-00825317							
C86	390	500	80-10395417	1469-0004		5R5T4		MCB243	MS-34	
C87	390	500	80-10395417	1469-0004		5R5T4		MCB243	MS-34	
C88	.0047	600		P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C89	.47	200		P288-47		PJ2P5		PT405	2TM-P47	
C90	100	500	80-10105417	1468-0001	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C91	.047	400		P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C92	.5	150		P185-5		PJ2P5		66P20	6TM-S47	
C93	.047	600		P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C94	68	2000	30-1246-1							
C95	.01	1000		P1088-01		PJ16S1		PT1611	MB-S1	
C96	.01	1000		P1088-01		PJ16S1		PT1611	MB-S1	
C97	.047	600		P688-047		PTE6S47		PT6147	6TM-S47	

Note 1. Some Models use 1000MMF in this application.
Note 2. Not used in all Models.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA PHILCO PART No	IRC PART No	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2500Ω	1	33-5563-53	QJ-402 **	RTV-391			Contrast-tapped ④ 1500Ω-Rear
B	5Meg							Brightness-Rear
R2A	500KΩ	1	33-5563-50	QJ-356 *	RTV-358	SBB-718	UF54L } †	Horiz. Hold-Panel
B	250KΩ						UR254L }	Vert. Hold-Rear
R3A	2Meg	2	33-5564-14	QB-139X	AT-116	BT-82-S	UT-451	Volume-tapped ④ 1Meg
B	Shaft		Not Req.	RQ	FS-3	Not Req.	Not Req.	Attach to R3A
C	Switch		Not Req.	76-1	SW-A	Not Req.	US-26	Attach to R3A
R4A	10KΩ	2	33-5546-41	WK-10K	A43-10K			Width-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4			Attach to R4A
R5A	1Meg	2	33-5565-42	QH-137	AG-61-S	AB-69	SU-54	Vert. Linearity
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	5Meg	2	33-5565-31	QH-141	AG-85-S	AB-87	SU-67	Height
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	250KΩ	2	33-5565-17	QH-130	AG-55-S	AB-50	SU-46	Horiz. Hold Centering
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8	5Ω	1						Hum Bucking-Wire Wound-Mounted on speaker

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-123 & P1-200 (Panel) B11-130 & R1-216 (Rear)
** CONCENTRIKIT EQUIVALENT - KIT K-3 BASE ELEMENTS & SHAFTS W17-111 & P3-131 (Panel) B17-141 & R1-126 (Rear)
† Universal Replacement - (Mallory exact duplicate part #UE966)

RESISTORS

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	NOTES
R9	1Meg	1		BTS-1Meg	
R10	1Meg	1		BTS-1Meg	
R11	22KΩ	1		BTS-22K	
R12	1000Ω	1		BTS-1000	
R13	2.2Meg	1			
R14	1000Ω	1		BTS-1000	
R15	2.2Meg	1			
R16	100KΩ	1		BTS-100K	
R17	27KΩ	1	66-3274340		
R18	6800Ω	1		BTS-6800	
R19	70KΩ	1			
R20	10KΩ	1	66-3104340		
R21	6800Ω	1		BTS-6800	
R22	18Ω	1			
R23	10Ω	1			
R24	15KΩ	1		BTS-15K	
R25	47Ω	1			
R26	330Ω	1	66-1334340	BTA-330	
R27	2500Ω	6.2	33-3446-5	1 3/4A-2500	
R28	15KΩ	1			
R29	47Ω	1			
R30	1000Ω	1		BTS-1000	
R31	220Ω	1		BTS-220	
R32	18KΩ	1			
R33	270Ω	1		BTS-270	
R34	220Ω	1		BTS-220	
R35	6800Ω	1		BTS-6800	
R36	3900Ω	1		BTS-3900	
R37	1Meg	1		BTS-1Meg	
R38	330KΩ	1		BTS-330K	
R39	390Ω	1		BTS-390	
R40	12KΩ	1		BTS-12K	
R41	6800Ω	1		BTS-6800	
R42	3900Ω	7	33-1335-116	1 3/4A-4000	
R43	100KΩ	1		BTA-100K	
R44	470KΩ	1		BTS-470K	
R45	10KΩ	1		BTS-10K	
R46	270Ω	1		BTS-270	
R47	12KΩ	1	66-3124340	BTA-12K	
R48	22KΩ	1		BTS-22K	
R49	270Ω	1		BTS-270	
R50	22KΩ	1		BTS-22K	
R51	33KΩ	1		BTS-33K	
R52	3300Ω	1		BTS-3300	

RESISTORS (CONT.)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA PHILCO PART No.	IRC PART No.	NOTES
R53	10Meg	1		BTS-10Meg	
R54	270KΩ	1		BTS-270K	
R55	470KΩ	1		BTS-470K	
R56	270Ω	1	66-1274340	BTA-270	
R57	4700Ω	1		BTS-4700	
R58	68KΩ	1		BTS-68K	
R59	2700Ω	1		BTS-2700	
R60	4700Ω	1		BTS-4700	
R61	330Ω	1		BTS-330	
R62	22KΩ	2	66-3225340	BTB-22K	
R63	1000Ω	1		BTS-1000	
R64	1Meg	1		BTS-1Meg	
R65	330KΩ	1		BTS-330K	
R66	1Meg	1		BTS-1Meg	
R67	180KΩ	1		BTS-180K	
R68	1Meg	1		BTS-1Meg	
R69	120KΩ	1		BTS-120K	
R70	56KΩ	1		BTS-56K	
R71	1.2Meg	1		BTS-1.2Meg	
R72	220KΩ	1		BTS-220K	
R73	8200Ω	1	66-2824340	BTA-8200	
R74	18KΩ	2	66-3185340	BTB-18K	
R75	15Meg	1		BTS-15Meg	
R76	33KΩ	1		BTS-33K	
R77	820KΩ	1		BTS-820K	
R78	2700Ω	1		BTS-2700	
R79	3900Ω	1		BTS-3900	
R80	6800Ω	1		BTS-6800	
R81	22KΩ	1		BTS-22K	
R82	4700Ω	1		BTS-4700	
R83	180KΩ	1		BTS-180K	Note 1
R84	82KΩ	1		BTS-82K	Note 2
R85	1Meg	1		BTS-1Meg	Note 3
R86	4700Ω	1		BTS-4700	Note 4
R87	470KΩ	1		BTS-470K	Note 5
R88	2.2Meg	1		BTS-2.2Meg	
R89	150Ω	1		BTS-150	
R90	22KΩ	1		BTS-22K	Note 6
R91	1000Ω	1		BTS-1000	
R92	1000Ω	1		BTS-1000	
R93	15KΩ	1		BTS-15K	
R94	100KΩ	1		BTS-100K	
R95	100KΩ	1		BTS-100K	
R96	4.7Meg	1		BTS-4.7Meg	
R97	4.7Meg	1		BTS-4.7Meg	
R98	68KΩ	1	66-3684340	BTA-68K	
R99	15KΩ	1		BTS-15K	
R100	1200Ω	1		BTS-1200	
R101	56KΩ	1		BTS-56K	
R102	47KΩ	1		BTS-47K	
R103	10KΩ	1		BTS-10K	
R104	10KΩ	1		BTS-10K	
R105	1Meg	1		BTS-1Meg	
R106	270KΩ	2		BTS-270K	Note 7
R107	4200Ω	5	33-1335-101	1 3/4A-4000	
R108	39KΩ	1		BTA-39K	Note 8
R109	6500Ω	5	33-1335-99	1 3/4A-7000	
R110	27KΩ	1		BTS-27K	
R111	68KΩ	1	66-3684340	BTA-68K	
R112	470Ω	1		BTS-470	
R113	2.7Ω	1			
R114	5Ω	10	33-3448-5		
R115	1Meg	1		BTS-1Meg	
R116	*	*			
R117	10Ω	1			
R118	470KΩ	1		BTS-470K	

Note 1. Some Models use a 270KΩ resistor in this application.
Note 2. Some Models use a 68KΩ resistor in this application.
Note 3. Some Models use a 1.5Meg resistor in this application.
Note 4. Some Models use a 8200Ω resistor in this application.
Note 5. Some Models use a 680KΩ resistor in this application.
Note 6. Some Models use a 47KΩ resistor in this application.
Note 7. Some Models use a 470KΩ resistor in this application.
Note 8. Some Models use a 22KΩ resistor in this application.
* Special Resistor 17" of #24 wire.

TRANSFORMER (FILAMENT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC	6.7VAC			32-8573					
	② 6A	②8.2A			32-8572 ①					

① Alternate filament trans.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	170Ω	300Ω	32-8431-7			TBO-4			Vert. Osc. Trans.
			32-8431-2 ①						
T3	591Ω tap ④ 19Ω, 41Ω, 66Ω	0Ω	32-8572						Horiz. Output Trans.
T4	960Ω tap ⑤ 13Ω		32-8577-1	A-8113 ②	A-3036 ②	TSO-11 ③	A-99X ④ ②	204T2 ② ③	Vert. Output Trans.
T5A	44Ω		32-9468	DY-12A ⑤	MDF-71 ⑤	TY-8 ⑤			Horiz. Deflection Coils
B	47Ω								Vert. Deflection Coils

① Alternate Vert. Osc. Trans.
② Connect as Auto. Trans.
③ Drill new mounting holes.
④ Drill new mounting hole.
⑤ Use original Deflection Coil network.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	5.8KΩ	3.2Ω	475Ω	.7Ω	32-8578	A-3878	A-2930	RO-9 ①	S-3X	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA PHILCO PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	59Ω	3.2Ω	36-1641-8		6E59S	① Speaker use in Models 53T1824, 53T1825, 53T1826, 53T2125, 53T2125L
				36-1641-10 ①			② Speaker used in Model 53T1852
				36-1646-8 ②			③ 10" PM Speaker used in Models 53T1854, 53T2152, 53T2152L, 53T2260, 53T2264, 53T2272, and 53T2272L
				36-1646-6 ③			

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	MILLER PART No.	NOTES
L1	Ant. Trans.	.7Ω	.7Ω	32-4432-2		
L2	Ant. Trans.	.7Ω	.7Ω			Part of L1.
L3	FM Trap	0Ω		32-4438-2		
L4	Ant. Coils	0Ω		76-7654		Includes Switch, Wafer and Coils.
L5	Neutr. Coil	0Ω		32-4550-10		
L6	RF Coils	0Ω		76-7656		Includes Switch, Wafer and Coils.
L7	Fil. Choke	0Ω		32-4500-1		
L8	Mixer Grid Coils	0Ω		76-7658		Includes Switch, Wafer and Coils.
L9	Fil. Choke	0Ω		32-4500-1		
L10	Osc. Coils	0Ω		76-7660		Includes Switch, Wafer and Coils.
L11	RF Choke	0Ω		32-4550-7		
L12	Conv. Plate	.1Ω		32-4359-13		
L13	Video IF Coup.	0Ω	0Ω	32-4548-29		
L14	28.1MC Trap	.1Ω		32-4486-27	6171A*	
L15	1st Video IF	.4Ω		32-4486-32	6171A*	
L16	2nd Video IF	.2Ω		32-4486-30	6189*	
L17	22.1MC Trap	.1Ω		32-4496		Tapped.
L18	Fil. Choke	.2Ω		32-4112-15	4606	2, 9 Microhenries.
L19	3rd Video IF	.2Ω	.3Ω	32-4486-33		
L20	4th Video IF	.2Ω	.3Ω	32-4486-33		
L21	Series Peaking Coil	1.9Ω		32-4143-16	6176	40 Microhenries.
L22	Series Peaking Coil	.3Ω		32-4480-8	4608	4 Microhenries.
L23	Series Peaking Coil	3.8Ω		32-4143-23		25 Microhenries.
L24	Variable Shunt Peaking Coil	6Ω		32-4467-13		175-500 Microhenries.
L25	4.5MC Trap	4.2Ω		32-4463-7	1470	
L26	Series Peaking Coil	5.5Ω		32-4480-4	6181	250 Microhenries.
L27	Series Peaking Coil	2.6Ω		32-4480-11	4630	60 Microhenries.
L28	Sound IF	4.1Ω		32-4463-10	1470	
L29	Ratio Det.	5Ω	.7ΩCT	32-4450-5	6205	Tertiary Winding - .85Ω
L30	Fil. Choke	.2Ω		32-4112-15	4606	2, 9 Microhenries.
L31	Horiz. Osc.	180Ω		32-4557	6210	
L32	RF Choke	2.2Ω				15, 2 Microhenries; Part of Horiz. Output Trans. T3.
L33	RF Choke	2Ω		32-4112-24	4612	11.4 Microhenries.
L34	RF Choke	1.8Ω		32-4112-25	4612	11.6 Microhenries.

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA PHILCO PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.270A	34-8003-14		6Q4	1090A	6S300	300
M2	.270A	34-8003-14		6Q4	1090A	6S300	300

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA PHILCO PART No. FUSE	PHILCO PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3	3AG-Slo Blo-P/T	1-6/10A 125V	42-2656-23		3150L 6 (3AG-1-6/10A-Slo-Blo P/T)		MDV-1-6/10	
M4	Length of No. 26 wire.		Length of No. 26 wire.		311010			

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA PHILCO PART No.	NOTES
M5	Bayonet	6-8	.15	Brown	34-2068	Type No. 47.

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M6	RF Tuner	76-7664	
M7	Crystal Diode	34-8022	(1N64)
M8	Focus Magnet	76-6126-4	(Includes Centering Device)
M9	Ion Trap	76-6077-2	
M10	Correction Magnet	76-6594	(2 Used)
	Cabinet	10841-18	Metal, Model 53-T1824
	Cabinet	10841-17	Metal, Model 53-T1825
	Cabinet	10936	Mahogany, Model 53-T1826
	Cabinet	10929-4	Mahogany, Model 53-T1852
	Cabinet	10929-7	Mahogany, Model 53-T1852L
	Cabinet	10929-8	Mahogany, Model 53-T1854
	Cabinet	10943	Mahogany, Model 53-T2125
	Cabinet	10943-1	Light, Model 53-T2125L
	Cabinet	10930	Mahogany, Model 53-T2152
	Cabinet	10930-1	Light, Model 53-T2152L
	Cabinet	10955	Mahogany, Model 53-T2227
	Cabinet	10916	Mahogany, Model 53-T2260
	Cabinet	10922	Mahogany, Model 53-T2264
	Cabinet	10948	Mahogany, Model 53-T2272
	Cabinet	10948-1	Light, Model 53-T2272L
	Safety Glass	54-8293-2	Models 53-T1824, 53-T1825
	Safety Glass	54-7943-41	Model 53-T1826
	Safety Glass	54-7943-57	Models 53-T1852, 53-T1852L, 53-T1854

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PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS (CONT.)

ITEM No.	PART NAME	PHILCO PART No.	NOTES
	Safety Glass	54-7943-61	Models 53-T2125, 53-T2125L
	Safety Glass	54-7943-38	Models 53-T2152, 53-T2152L
	Safety Glass	54-7943-49	Models 53-T2227, 53-T2272, 53-T2272L
	Safety Glass	54-7943-56	Models 53-T2260, 53-T2264
	Mask	54-8645-2	Model 53-T1852
	Mask	54-8645-1	Models 53-T1852L, 53-T1854
	Mask	54-8567-7	Model 53-T2-153L
	Mask	54-8573-12	Model 53-T2227
	Mask	54-8573-6	Model 53-T2260
	Mask	54-8573-11	Model 53-T2264
	Mask	54-8573-1	Models 53-T2272, 53-T2272L
	Knob	54-4768	Brightness, Vertical Hold, Model 53-T1824 (2 Used)
	Knob	54-4799	Brightness, Vertical Hold, Modesl 53-T1825, 53-T1826, 53-T1854, 53-T2125, 53-T2152, 53-T2227, 53-T2260, 53-T2264, 53-T2272, (2 Used)
	Knob	54-4799-1	Brightness, Vertical Hold , Model 53-T1852
	Knob	54-4799-3	Brightness, Vertical Hold, Models 53-T1852L, 53-T2152L, 53-T2272L.
	Knob	54-4799-2	Brightness, Vertical Hold, Model 53-T2125L
	Knob	54-4797	Contrast Horiz. Hold, Models 53-T1824, 53-T1825, 53-T1852, 53-T2125, 53-T2152, 53-T2227 (2 Used)
	Knob	76-6048	Contrast, Horiz. Hold, Models 53-T1826, 53-T1854, 53-T2260, 53-T2264, 53-T2272 (2 Used)
	Knob	76-6048-1	Contrast, Horiz. Hold, Models 53-T1852L, 53-T2152L, 53-T2272L
	Knob	54-4804-3	Off - On Volume, Model 53-T1824
	Knob	76-6166	Off - On Volume, Models 53-T1825, 53-T1852, 53-T2125, 53-T2152, 53-T2227
	Knob	76-6581-1	Off - On Volume, Models 53-T1826, 53-T1854, 53-T2260 , 53-T2264, 53-T2272
	Knob	76-6581-2	Off - On Volume, Models 53-T1852L, 53-T2152L, 53-T2272L
	Knob	76-6863-30	Channel Selector, Model 53-T1824
	Knob	76-6863-18	Channel Selector, Models 53-T1825, 53-T1852, 53-T2125, 53-T2227
	Knob	76-6863-14	Channel Selector, Models 53-T1826, 53-T1854, 53-T2152, 53-T2260, 53-T2264, 53-T2272
	Knob	76-6863-15	Channel Selector, Models 53-T1852L, 53-T2152L, 53-T2272L
	Knob	54-4803	Fine Tuning, Model 53-T1824
	Knob	76-6104	Fine Tuning, Model 53-T1825, 53-T1852, 53-T1852L,53-T1854, 53-T2125, 53-T2125L, 53-T2152, 53-T2152L, 53-T2227, 53-T2260, 53-T2264, 53-T2272, 53-T2272L
	Knob	76-6104-1	Fine Tuning , Model 53-T1826
	Knob		

TROUBLE SHOOTING AIDS – CONT.

SYNC

HORIZONTAL

LOSS OF SYNC:

Substitute V10, V11 and V12. Check waveform at W6.

If Satisfactory	If Unsatisfactory
Check T2 and other components associated with V12A.	Check C68, C69 and R81.

CRITICAL SYNC:

Substitute V10, V11 and V12. Follow procedure outlined under LOSS OF SYNC, VERTICAL.

TRIGGERING:

Substitute V12. Check C68. Check filament lead dress near V10, V11 and V12.

VERTICAL

LOSS OF SYNC:

Substitute V10, V11, V13 and V14. Check waveform at W10.

If Satisfactory	If Unsatisfactory
Check C80, R98 and R111.	Check R78 and C67.

CRITICAL SYNC:

Substitute V10, V11, V13 and V14. Follow procedure outlined under LOSS OF SYNC, HORIZONTAL.

VIDEO

SOUND BARS:

Check adjustment of 4.5MC trap, (All).
Check adjustment of local oscillator.
Check video IF alignment.

POOR RESOLUTION:

Substitute V1, V2, V3, V4 and V5. Check video IF alignment.

POOR CONTRAST:

Substitute V6. Check C4C, C39 and C43. Substitute V3, V4 and V5.
Check video detector assembly.

SMEAR:

Substitute V6. Check C39, C43 and C45. Check L25, L26 and L27 for open. Check R40 and R42 for change of value. Check video detector assembly.

ONE WIDE, BLACK BAR ACROSS PICTURE:

Check tuner, video IF and video amplifier tubes for heater to cathode leakage. Check video IF strip for 60 cycle modulation from filament lead leakage due to poor dress of filament leads.

DIM PICTURE:

Check picture tube. (Refer to DIM PICTURE, POWER SECTION.)

AUDIO

WEAK, OR NO SOUND:

Substitute V7, V8 and V9. Check ratio detector adjustment. Check 4.5MC amplifier stage. Check video IF alignment.

BUZZ:

Substitute V8. Check ratio detector adjustment.

DISTORTED:

Check circuits of V8B and V9 for distortion using audio signal generator. If no distortion is present check ratio detector and audio IF alignment.

POWER

SMALL RASTER, WEAK SOUND:

Measure B+. If low, substitute M1 and M2. Check C1, C2, C3 and C4 for leakage.

DIM PICTURE:

Measure B+, If low, proceed as outlined under SMALL RASTER, WEAK SOUND.
Check picture tube.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE:

Substitute V14, V15, V16 and V17.
Check waveform at W12.

If Satisfactory	If Unsatisfactory
Check T3, C93, C90, C91, R113 and other components associated with T3, V16 and V17.	Check circuit and components associated with V14.

WEAK HIGH VOLTAGE:

Substitute V14, V15, V16 and V17.
Measure B+.

If Low	If Satisfactory
Proceed as outlined under SMALL RASTER.	Proceed as outlined under LOSS OF HIGH VOLTAGE.

BLOOMING:

Substitute V17, V16 and V15. Check T3 and other components associated with high voltage.

GENERAL

RASTER, NO PICTURE, NO SOUND, NO SNOW:

Substitute V2, V5 and V6. Check components of the video IF strip.

WEAK SOUND, WEAK PICTURE: (HIGH SIGNAL AREAS)

Substitute V1, V3 and V4. Check components of video IF strip.

INTERMITTENT STREAKS:

Check high voltage circuit for corona discharge and arcing.

NOTE:

In low signal areas, if several of the tuner and IF tubes become slightly weak the overall result may be loss of picture and sound. This can be checked by substituting all of the tubes at once. Then replace, one at a time, the original tubes.

The Trouble-Shooting photographs shown above are made with permission of the transmitting station WFBM-TV and in no way reflect the quality of the transmitted picture. Similarly, symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

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SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

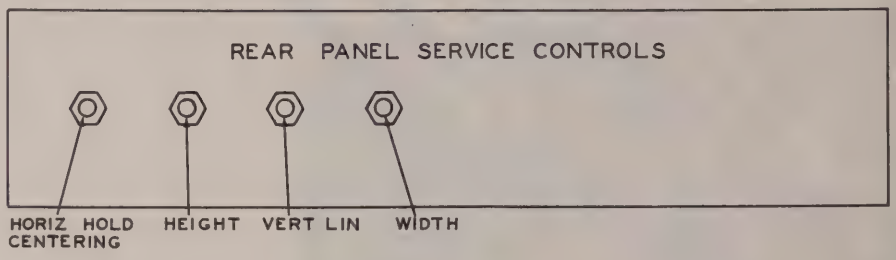
To clean safety glass remove four metal screws from inside of cabinet holding two metal strips on the front. Remove metal strips and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

SWEEP CHASSIS



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the Horiz. Hold Control at the center of its range and adjust the Horiz. ringing slug, L31, until picture synchronizes horizontally. (For location see tube placement chart). If satisfactory results cannot be obtained by the above adjustment see HORIZ. SWEEP CIRCUIT ADJUSTMENTS on page 11.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector buzz, adjust the Ratio Detector Secondary, L29, located on top of chassis. (See tube placement chart).

FUSES

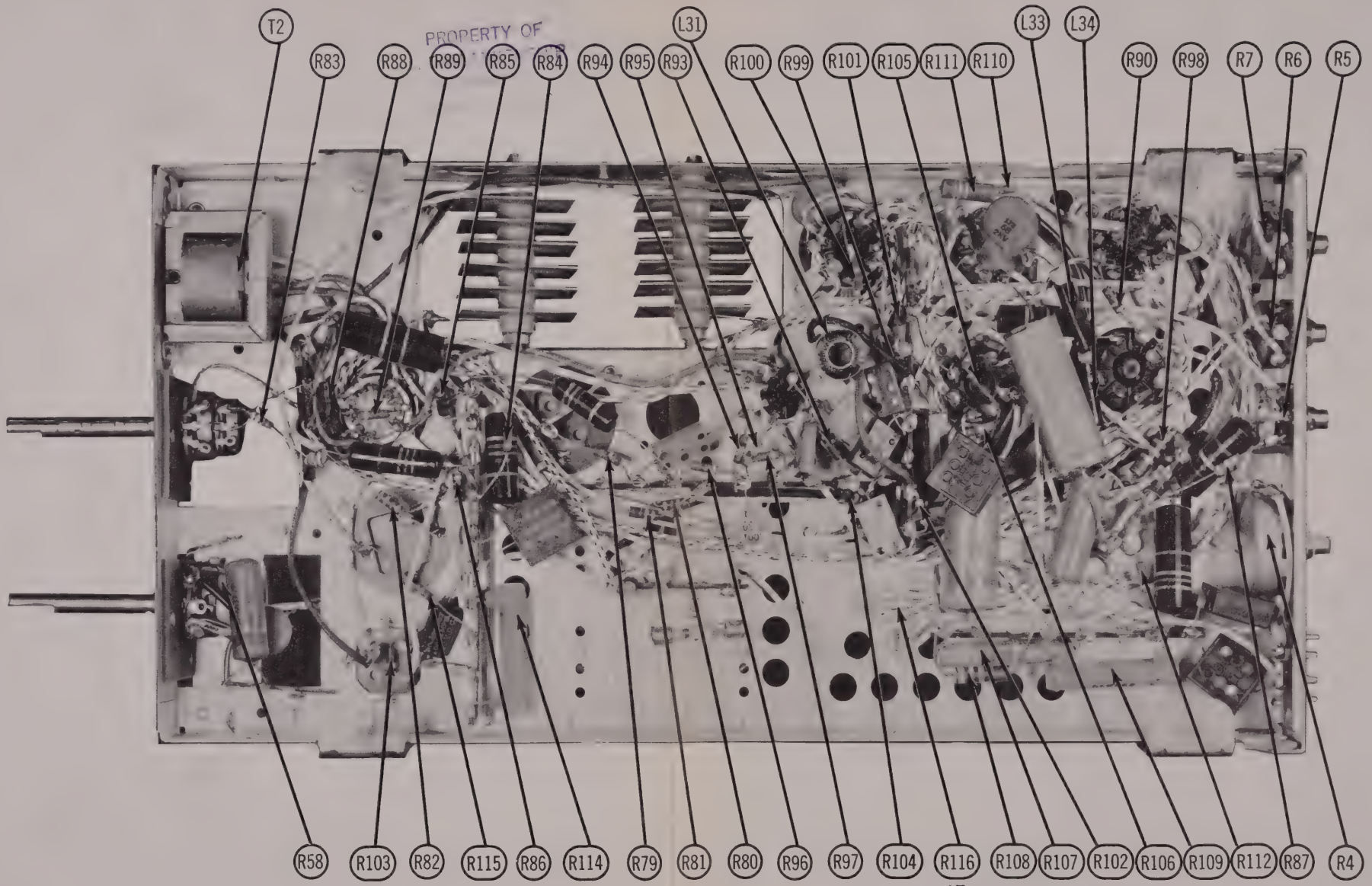
Two fuses are used. One for LV power supply protection and a piece of fusible wire for filament protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push on type control knobs and knob insulator from front panel.
2. Disconnect transmission line from rear cover.
3. Remove 12 wood screws. Remove rear cover.
4. Disconnect speaker, volume control cable, interconnection cable, yoke plug, HV lead and CRT socket.
5. Remove 4 chassis bolts from each chassis.
6. Remove both RF and Power chassis.



SWEEP CHASSIS - BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

SILVERTONE MODELS 1117-17, 1130-17, 1130A-17, 1141-20, 1145-20, 1162-17, 1172-17, 1173-20, 1181-20, 1183-21, 1188-20, 2100, 2150 (Ch. 110.700-100, -104, -120, -140, -150)

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MODEL 2100

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DATE 4-53 SET 201 FOLDER 8

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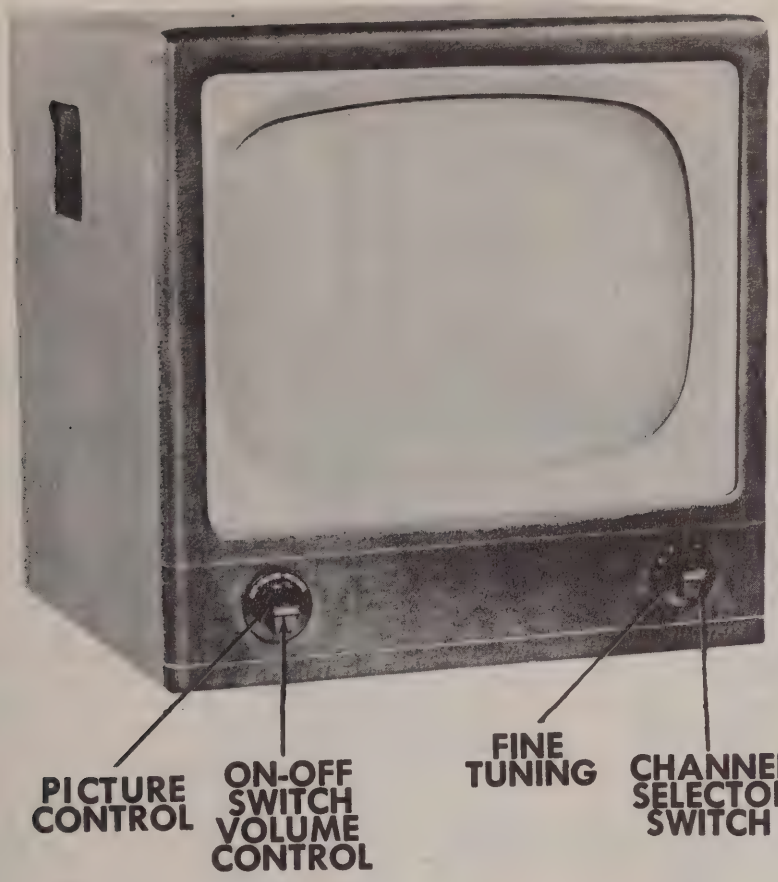
SILVERTONE MODELS 1117-17, 1130-17, 1130A-17, 1141-20, 1145-20, 1162-17, 1172-17, 1173-20, 1181-20, 1183-21, 1188-20, 2100, 2150 (Ch. 110.700-100, -104, -120, -140, -150)



SILVERTONE MODEL 2100

TRADE NAME	Silvertone Models 1117-12, 1130-17, 1130A-17, 1162-17, 1172-17, 2100 (Ch. 110.700-100, -104) 1141-20, 1181-20 (Ch. 110.700-120) 1145-20, 1173-20, 1188-20, 2150 (Ch. 110.700-140) 1183-21 (Ch. 110.700-150)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 1.78 Amp. @ 117 Volts AC
TUNING RANGE—Channels 2 thru 13, Video IF 25.7MC, Sound IF 21.2MC (Intercarrier).

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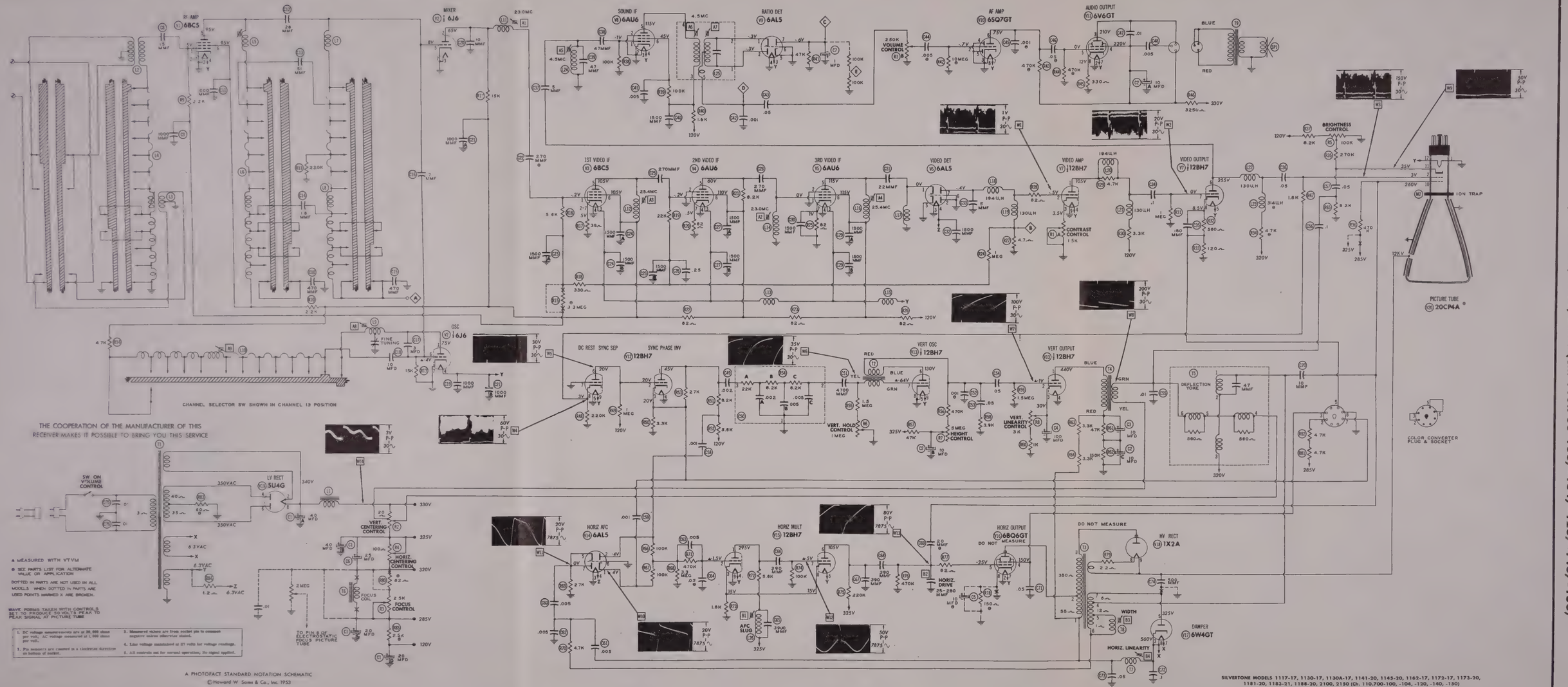
DATE 4-53 SET 201 FOLDER 8



SILVERTONE MODELS 1117-17, 1130-17, 1130A-17, 1141-20, 1145-20, 1162-17, 1172-17, 1173-20, 1181-20, 1183-21, 1188-20, 2100, 2150 (Ch. 110.700-100, -104, -120, -140, -150)

A MEASURED WITH VTVM

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements are at 30,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Measured values are from socket pin to common negative unless otherwise stated.
3. Pin numbers are counted in a clockwise direction on bottom of socket.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; No signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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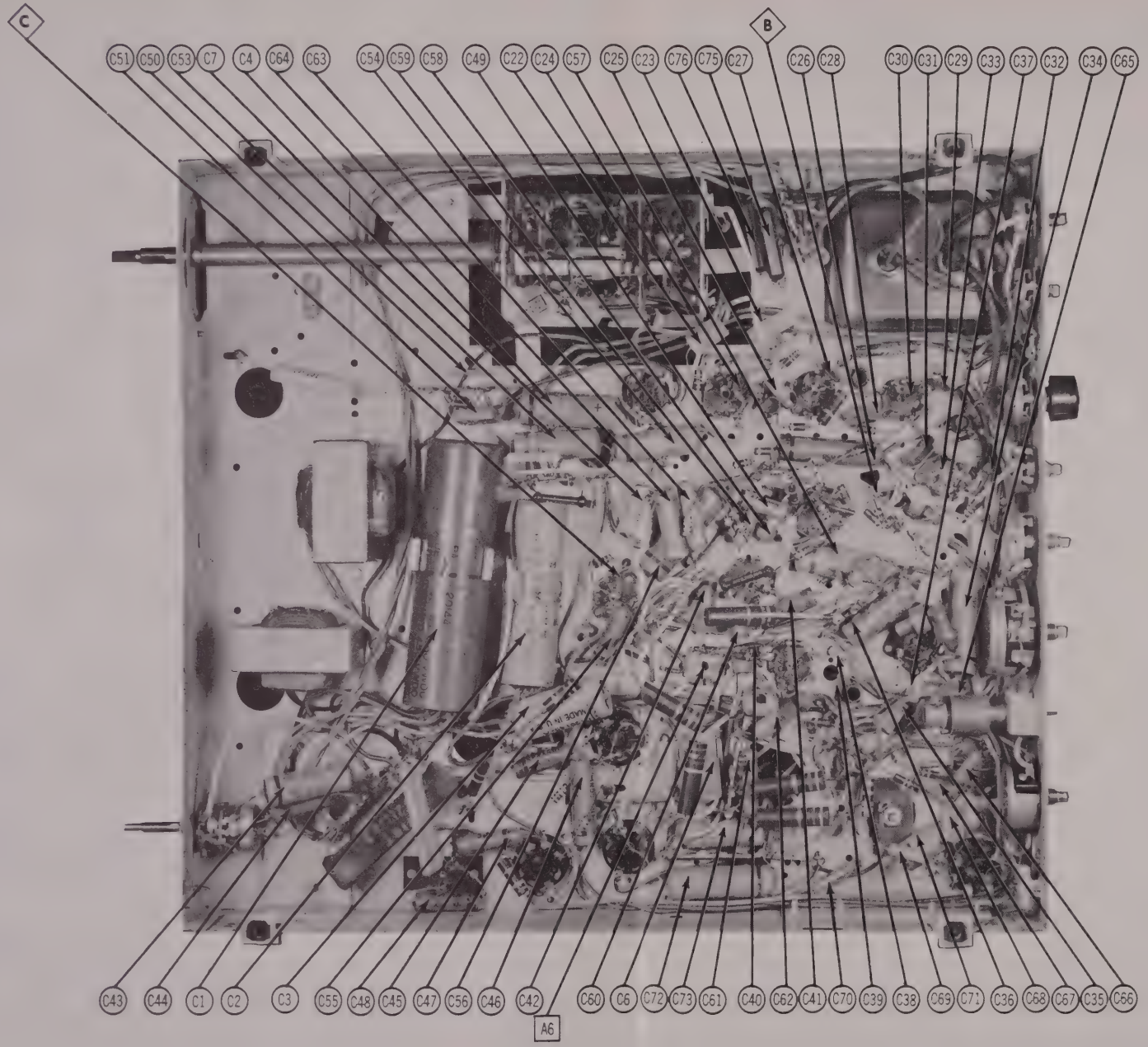
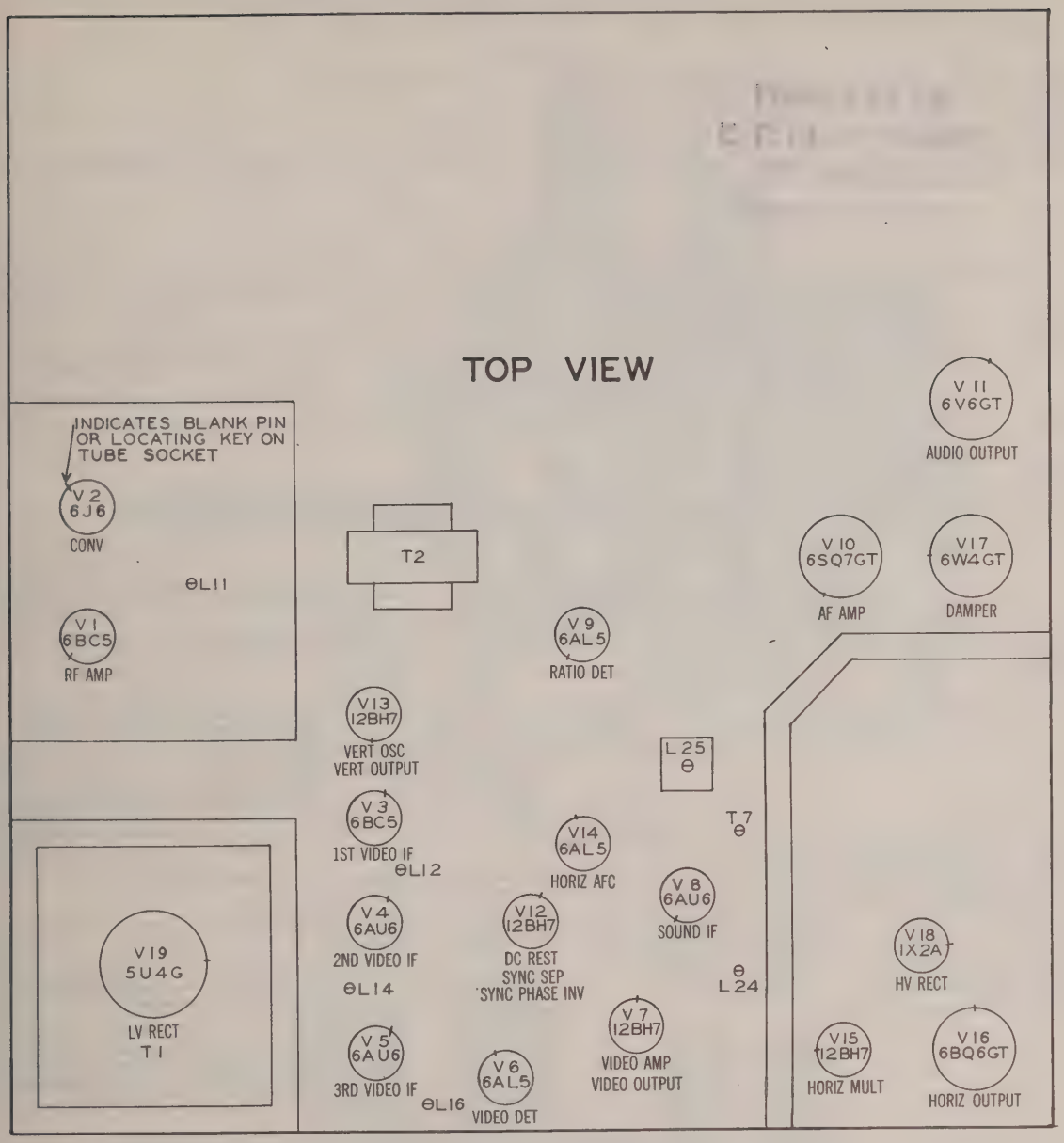
SILVERTONE MODELS 1117-17, 1130-17, 1130A-17, 1141-20, 1145-20, 1162-17, 1172-17, 1173-20, 1181-20, 1183-21, 1188-20, 2100, 2150 (Ch. 110.700-100, -104, -120, -140, -150)

CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART


TOP VIEW
INDICATES BLANK PIN OR LOCATING KEY ON TUBE SOCKET
V 2 6J6 CONV
θL11
V 1 6BC5 RF AMP
T2
V 9 6AL5 RATIO DET
V 11 6V6GT AUDIO OUTPUT
V 10 6SQ7GT AF AMP
V 17 6W4GT DAMPER
V 13 12BH7 VERT OSC VERT OUTPUT
L 25 θ
T 7 θ
V 3 6BC5 1ST VIDEO IF
θL12
V 14 6AL5 HORIZ AFC
V 8 6AU6 SOUND IF
V 4 6AU6 2ND VIDEO IF
θL14
V 12 12BH7 DC REST SYNC SEP SYNC PHASE INV
θ L24
V 18 1X2A HV RECT
V 19 5U4G LV RECT T1
V 7 12BH7 VIDEO AMP VIDEO OUTPUT
V 5 6AU6 3RD VIDEO IF
θL16
V 6 6AL5 VIDEO DET
V 15 12BH7 HORIZ MULT
V 16 6BQ6GT HORIZ OUTPUT

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V19

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster, - V2, V3, V4, V5, V6, V7
No pic, no sound,has snow - V1, V2, V3
No pic, has sound, has raster - V7 , V20
Has pic, no sound - V8, V9, V10, V11

SYNC FAILURE
No vert. sync - V12, V13
No horiz. sync - V12, V14, V15
No vert. or horiz. sync - V12

SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V20
No vertical deflection - V13
Poor vert. linearity or foldover - V13
Poor horiz. linearity or foldover - V15, V16, V17
Narrow Picture - V15, V16, V17, V18, V19
Vert. Off Freq. - V12, V13
Horiz. Off Freq. - V12, V14, V15

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the AGC terminal on the tuner. Connect the positive lead to chassis.
Set contrast control at 1/4 turn from counter clockwise position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD	High side to point ◇A◇ Low side to chassis.	23MC	Any non-interfering channel.	DC probe to point ◇B◇ Common to chassis.	A1, A2	Adjust for maximum deflection. Attenuate generator to maintain 2.5 volts at VTVM.
2.	"	"	25.4MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	.001MFD	High side to point ◇A◇ Low side to chassis.	24MC (10MC Swp)	21.20MC 25.70MC	Any non-interfering channel.	Vert. amp. to point ◇B◇ Low side to chassis.		Check for response similar to Fig. 1. If necessary retouch A1 thru A4 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point ◇C◇ to chassis. The junction of these two resistors is alignment point ◇E◇ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.001MFD	High side to point ◇B◇ Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel.	DC probe to point ◇C◇ Common to chassis.	A5, A6	Adjust for maximum deflection.
5.	"	"	"	"	DC probe to point ◇D◇ Common to point ◇E◇	A7	Adjust for a zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.001MFD	High side to point ◇B◇ Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel.	Vert. amp. to point ◇C◇ Low side to chassis.	A5, A6	Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
5.	"	"	"	"	"	Vert. amp to point ◇D◇ Low side to chassis.	A7	Reconnect capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines

OSCILLATOR ALIGNMENT

Connect bias battery as under Video IF Alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp to point ◇B◇ Low side to chassis.	A8	Adjust to place Video marker at 50% on high frequency side of response curve.
7.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"		Check all high band channels for correct marker placement. IF necessary make slight compromise adjustment of A8 for best marker marker placement on all channels.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
8.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6		A9	Adjust to place video marker at 50% on high frequency side of response curve.
9.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"		Check low band channel for correct marker placement. If necessary make slight compromise adjustment of A9 for best marker placement on all channels.
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

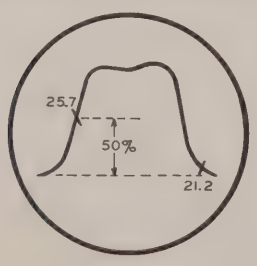


FIG. 1

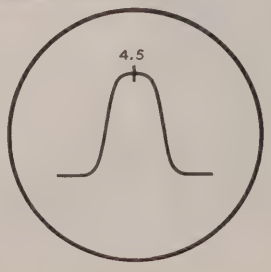


FIG. 2

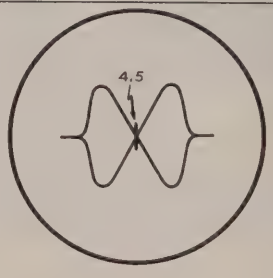
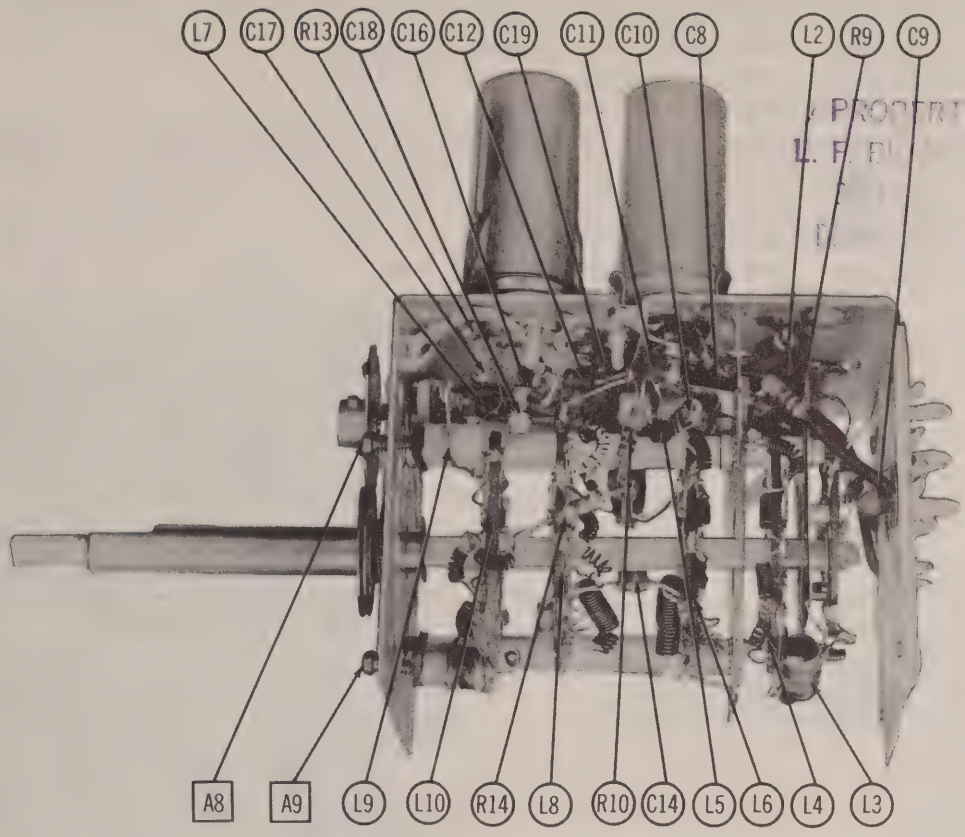
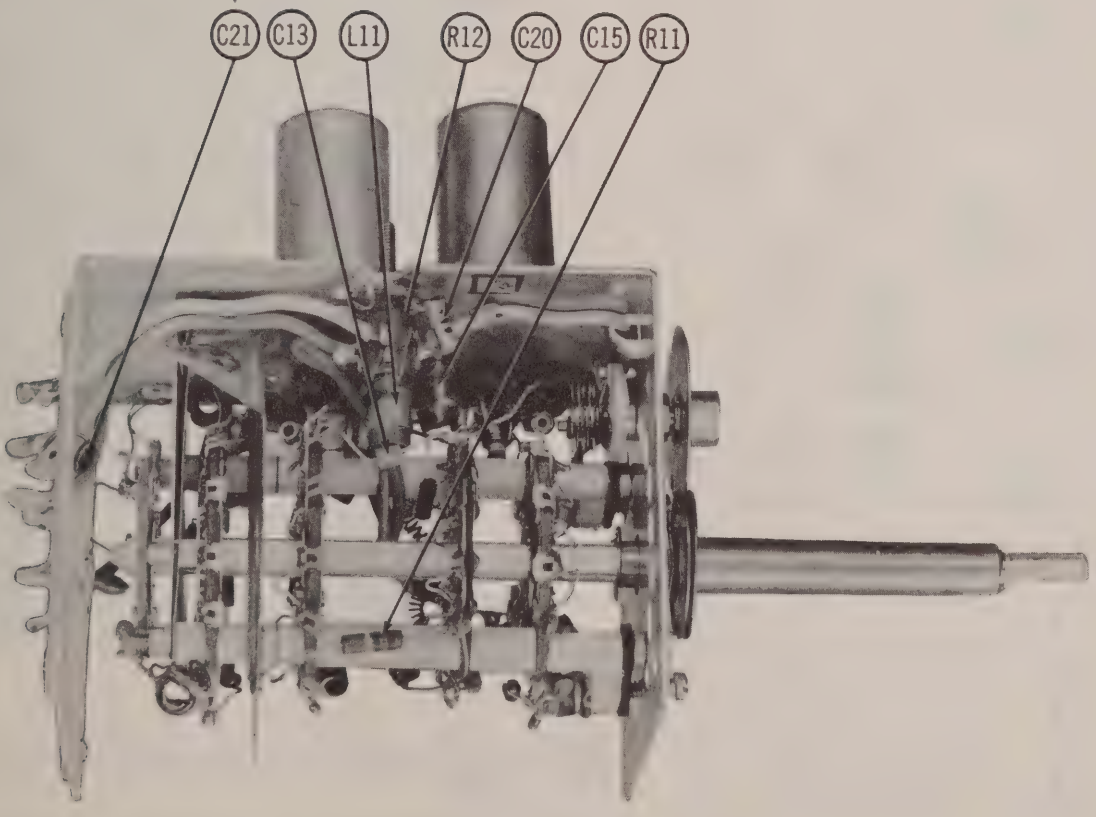


FIG. 3



RF TUNER-RIGHT SIDE

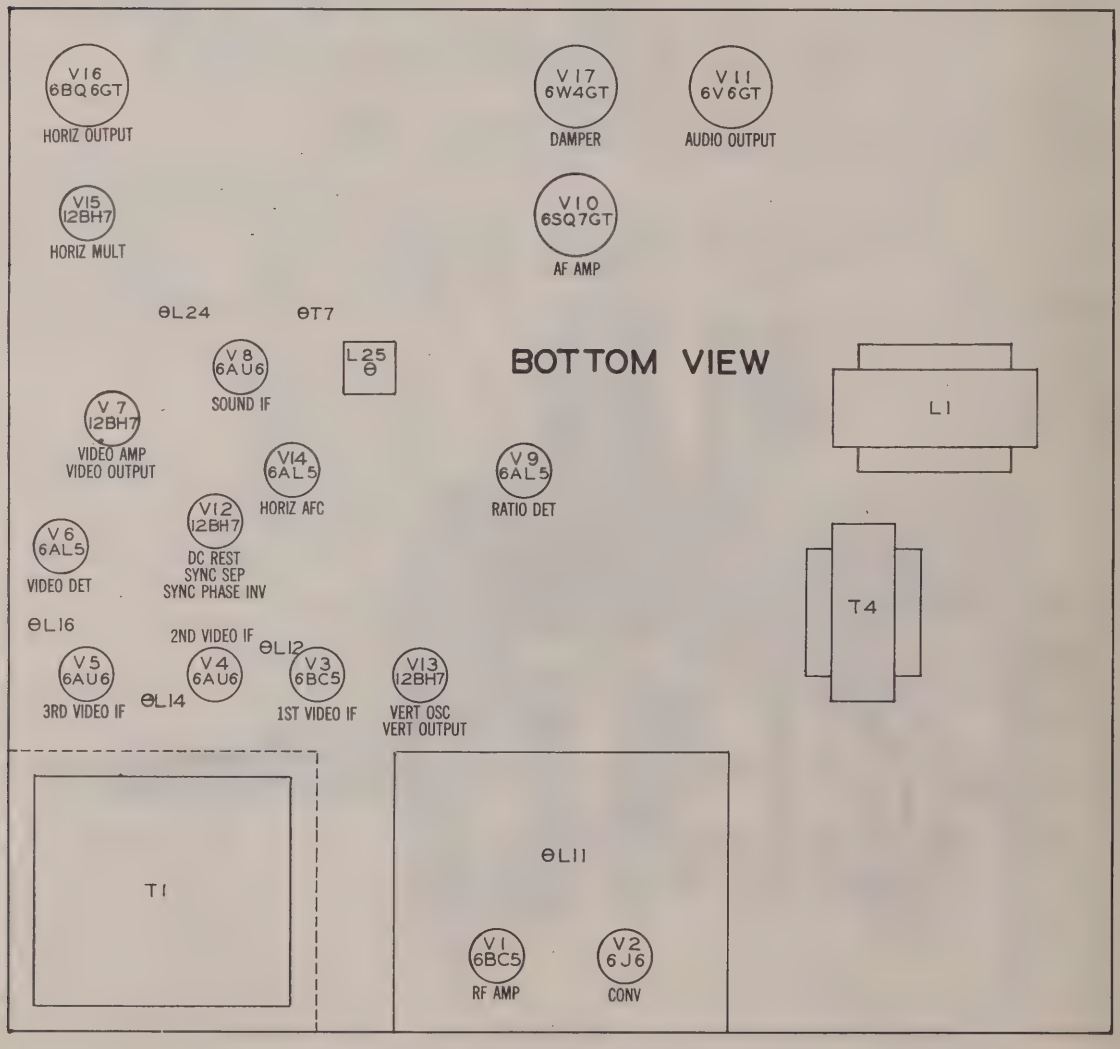


RF TUNER-LEFT SIDE

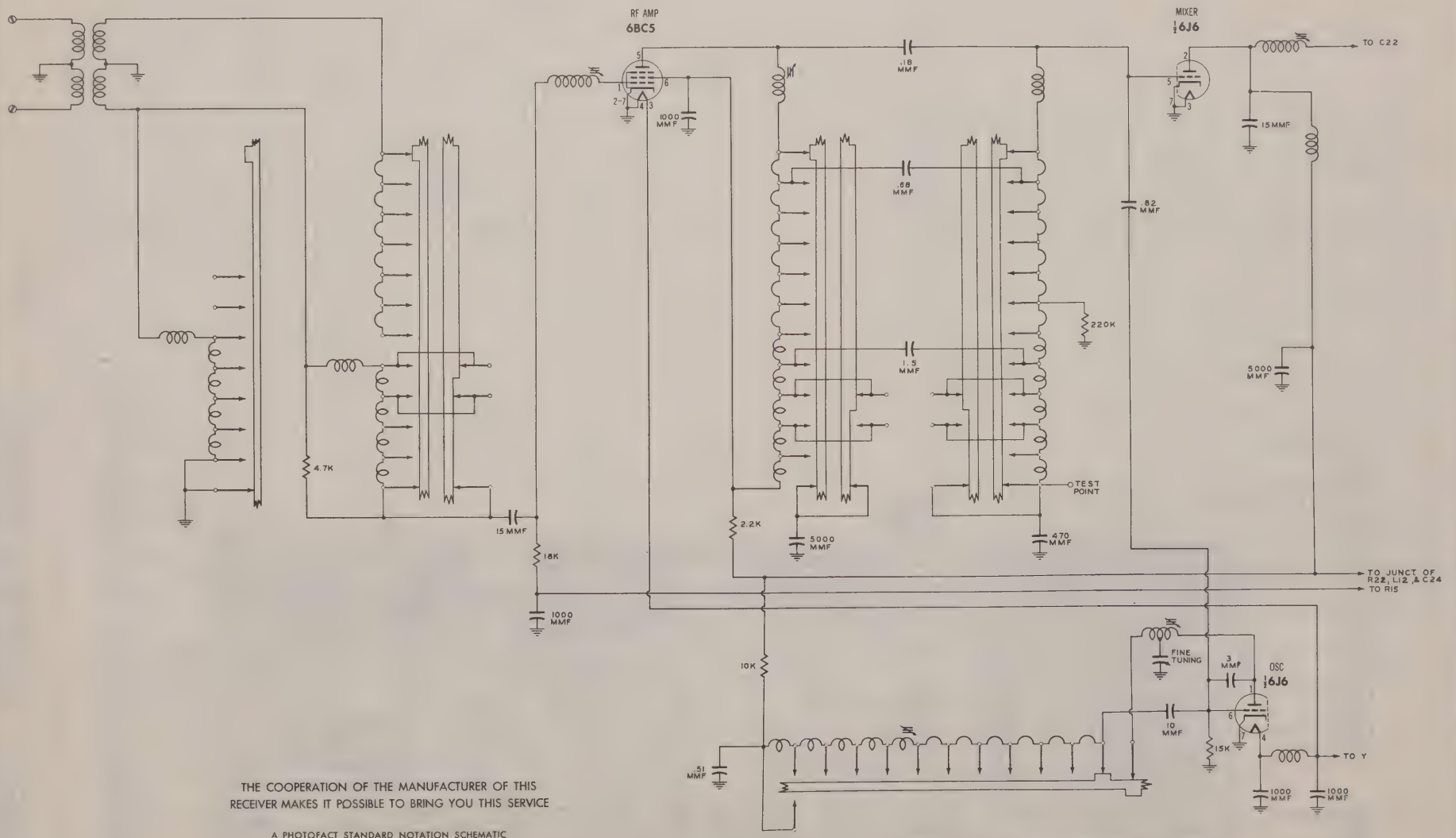
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	4.3Meg	0Ω	0Ω	.1Ω	†5.5KΩ	†5.5KΩ	0Ω		
V 2	6J6	†10KΩ	†20KΩ	0Ω	.1Ω	220KΩ	15KΩ	0Ω		
V 3	6BC5	1 Meg	39Ω	.4Ω	0Ω	†3.4KΩ	†3.4KΩ	39Ω		
V 4	6AU6	1 Meg	0Ω	.4Ω	0Ω	†11.5KΩ	†3.3KΩ	82Ω		
V 5	6AU6	.2Ω	0Ω	.2Ω	0Ω	†3.2KΩ	†3.2KΩ	82Ω		
V 6	6AL5	2.8Ω	0Ω	0Ω	.1Ω	0Ω	0Ω	4.7KΩ		
V 7	12BH7	†6.4KΩ	4.8KΩ	800Ω	.1Ω	.1Ω	†4.8KΩ	1 Meg	680Ω	0Ω
V 8	6AU6	100KΩ	0Ω	0Ω	.1Ω	†4.9KΩ	†100KΩ	0Ω		
V 9	6AL5	INF	INF	.8Ω	0Ω	0Ω	0Ω	47KΩ		
V 10	6SQ7GT	0Ω	10 Meg	0Ω	0Ω	0Ω	†470KΩ	.1Ω	0Ω	
V 11	6V6GT	INF	0Ω	†3.6KΩ	†3.3KΩ	470KΩ	INF	.1Ω	330Ω	
V 12	12BH7	†12KΩ	†1 Meg	3.3KΩ	0Ω	0Ω	†1 Meg	0Ω	220KΩ	.1Ω
V 13	12BH7	#7.9KΩ	1.5Meg	2.9KΩ	0Ω	0Ω	†1.1Meg	2.3Meg	0Ω	.1Ω
V 14	6AL5	3.4Meg	3.4Meg	0Ω	.8Ω	2.7KΩ	0Ω	2.7KΩ		
V 15	12BH7	†5.7KΩ	3.8Meg	1.8KΩ	.1Ω	.1Ω	†220KΩ	100KΩ	1.8KΩ	0Ω
V 16	6BQ6GT	470KΩ	0Ω	INF	†10KΩ	470KΩ	INF	.1Ω	0Ω	Top Cap #82Ω
V 17	6W4GT	†85Ω	INF	100KΩ	INF	†100Ω	INF	#.2Ω	#0Ω	
V 18	1X2A		PINS	1 - 9	HAVE	INF	RESISTANCE			Top Cap #432Ω
V 19	5U4G	INF	30KΩ	INF	¶40Ω	INF	¶35Ω	INF	30KΩ	
V 20	20CP4	0Ω	220KΩ	Pin 10 †470KΩ	Pin 11 330KΩ	Pin 12 .1Ω				

† MEASURED FROM PIN 8 OF V19
# MEASURED FROM PIN 3 OF V17
¶ MEASURED FROM CENTER TAP OF T1



TUBE PLACEMENT CHART



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A PHOTOFACT STANDARD NOTATION SCHEMATIC

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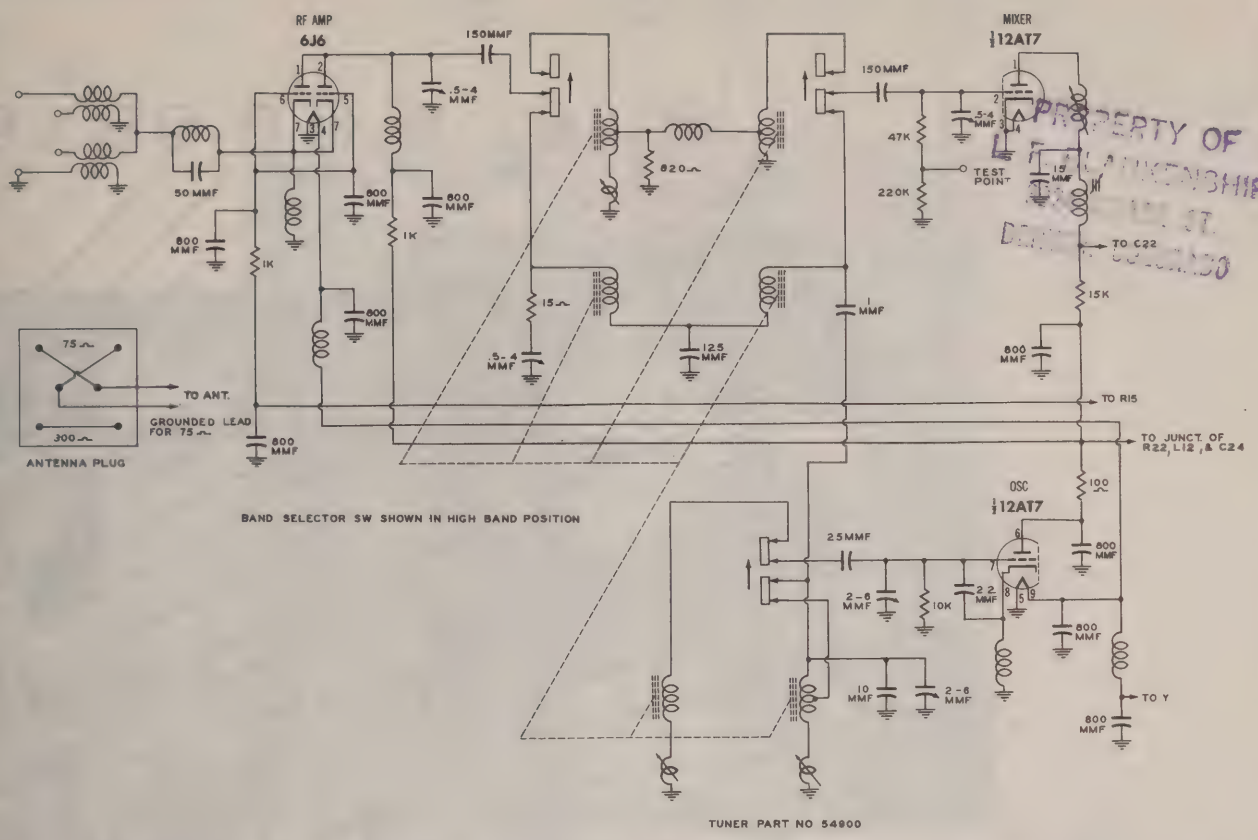
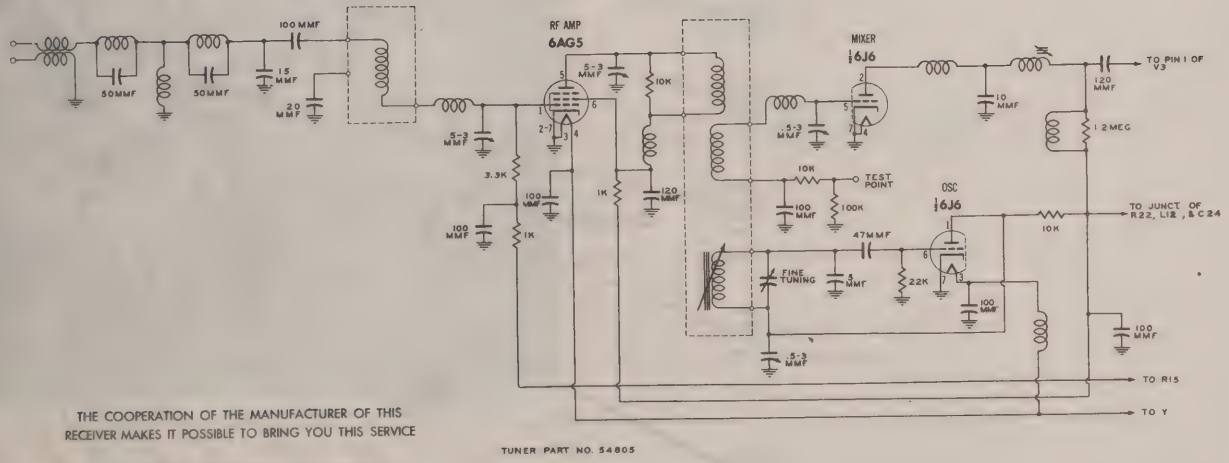
CHANNEL SELECTOR SW SHOWN IN CHANNEL 13 POSITION

TUNER PART NOS. 54946 & 541114

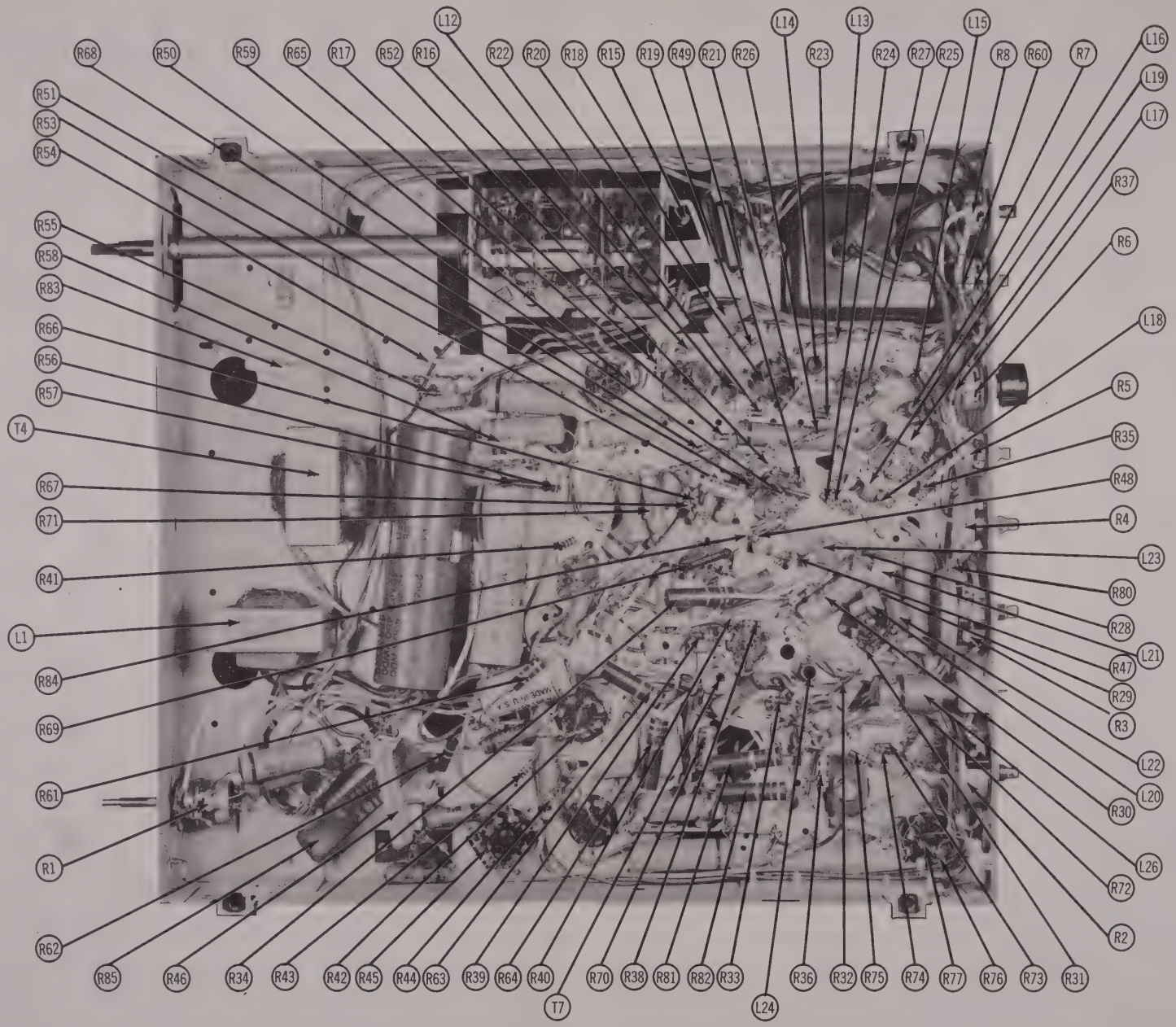
ALTERNATE TUNER SCHEMATIC TT5AL-SWITCH TYPE



ALTERNATE TUNER SCHEMATIC- CONTINUOUS TYPE

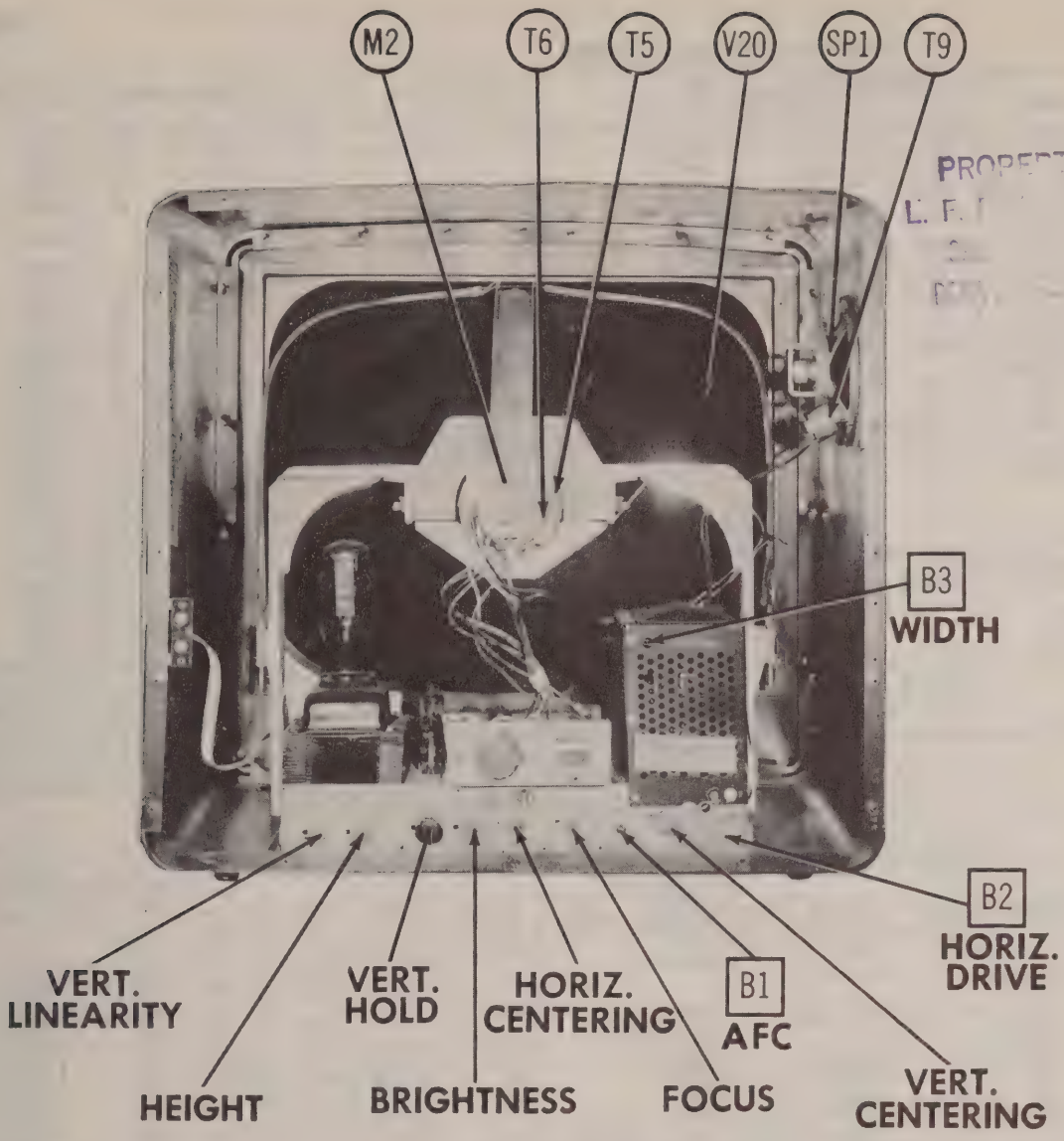


ALTERNATE TUNER SCHEMATIC- TURRET TYPE



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. F. [illegible] SHIP



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the AFC slug (B1) for horizontal synchronization.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of a vertical white line or compression of the center of the picture.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BC5	6BC5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video	6BC5	6BC5	7BD	
V4	2nd Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd Video IF Amp.	6AU6	6AU6	7BK	
V6	Video Detector	6AL5	6AL5	6BT	
V7	Video Amplifier - Video Output	12BH7	12BH7	9A	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amplifier	6SQ7GT	6SQ7GT	8Q	
V11	Audio Output	6V6GT	6V6GT	7S	
V12	DC Restorer - Sync Separator - Sync Phase Inv.	12BH7	12BH7	9A	
V13	Vert. Oscillator - Vert. Output	12BH7	12BH7	9A	
V14	Horiz. AFC	6AL5	6AL5	6BT	
V15	Horiz. Mult.	12BH7	12BH7	9A	
V16	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1X2A	1X2A	9Y	
V19	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V20A	17BHP4			12C	① Used on Ch. 110,700-100
B	17BP4A ①			12D	② Used on Ch. 110,700-120, -140
C	20CP4 ②			12D	③ Used on Ch. 110,700-150
		20CP4		12D	④ Circuit change necessary
		20DP4 ③		12D	⑤ 3/8" longer
		20DP4A ④ ⑤		12D	
		20LP4 ④ ⑤		12C	
D	21EP4 ③			12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	450	A20144	PRS450/40-		BO45		FP447	TVA-2740	Red
B	40	450		40		BRD2245			TVA-2730	Blue
C	20	450		PRS450/20-						Orange
D	20	450		20						Green
C2A	10	450	A20135	PRS450/10-10		UP1145		4N727	TVA-2722	Red
B	10	450		PRS450/10					TVA-1705	Yellow
C	10	450								Blue
C3	10	250	A20145	PRS250/12		BR1225A		TC52	TVA-1504	
C4	100	25	A20130	PRS25/100		BRH251A		TC2501	TVA-1207	
C5	10	25	A20137	PRS25/10		BR102A		TC22	TVA-1204	Note 1
C6	25	12	A20147	PRS25/25		BR252A		TC26	TVA-1205	
C7	1	50	A20138	PRS150/4		BBR-1-50T		TC31	TVA-1300	
C8	15		A556-203	SI15	D6-150	TM5D1	GP1K-150	UC-5415	5GA-Q15	
C9	1000		A19132	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C10	470		A19139	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C11	1000		A19132	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C12	.28		A19151				NP0K-R50			
C13	.51		A19152		TCZ-.5		NP0K-1R0			
C14	1.8		A19153				NP0K-1R8			
C15	470		A19139	SI470	D6-471	TM5T5	GP2K-471	UC-5347	5GA-T47	
C16	7				TCZ-.68		NP0K-R68			
C17	3		A19154							
C18	10		A556-201-2	SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C19	1000		A19132	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C20	10		A556-201-2	SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C21A	3000			BPD-2X001	DD-2-102	TM5DD1	812-001	DCD-521	5HK-2D1	
B	3000									
C22	270	500	A190-133	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	Note 2
C23A	1500		A19147	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C24A	1500		A19147	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C25	270	500	A190-133	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C26	25	200	A194-187	P488-25		PTE4P25		PT4025	4TM-P25	
C27A	1500		A19147	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C28	270	500	A190-133	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C29A	1500		A19147	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C30	1500		A19148	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C31	22	500	A190-107	SI22	D6-220	5R5Q25	GP1K-220	UC-5422	5GA-Q22	
C32	1500		A190-148	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C33	5		A555-100	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C34	.1	600	A194-162	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C35	180	500	A190-129	SI180	D6-181		GP2K-181	UC-5318	5GA-T18	
C36	.05	600	A194-160	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C37	5		A55-100	SI5	TCZ-4.7	5W5V5	GP1K-050	UC-555	5GA-V5	
C38	47		A555-113-2	SI47	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C39	47	500		1469-00005		5R5Q5		MCB225	MS-45	
C40	1500		A19148	BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	
C41	.005	600	A194-151	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C42	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C43	.05	600	A194-160	P688-05	DF-503	PTE6S5		PT615	6TM-S5	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C44	.005	600	A194-151	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	Note 7
C45	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	Note 7
C46	.05	600	A194-160	P688-05	DF-503	PTE6S5		PT615	6TM-S5	Note 7
C47	.01	600	A194-155	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C48	.005	600	A194-151	P688-005	D6-502	PTE6D5	GP2-333-502	PT615	6TM-D5	
C49	.002	600	A194-146	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C50A	.002			P688-002		PTE6D2		PT622		
B	.005		♦PB20150	P688-005	♦PC-100	PTE6D5	♦1405-01	PT625	♦10IC1	
C	.005			P688-005		PTE6D5		PT625		
C51	4700	500	A192-163	1464-005		MCB1465		MS-25		
C52	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	Note 3
C53	.05	600	A194-160	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C54	.05	600	A194-160	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C55	.01	600	A194-155	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C56	.1	600	A194-162	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C57	.05	600	A194-160	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C58	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C59	.001	600	A194-145	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C60	.005	600	A194-151	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C61	.005	600	A194-151	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C62	.005	600	A194-151	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C63	.005	600	A194-151	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C64	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	Note 4
C65	3900	500	A195-261	1464-004		1DRS5D4		MCB463	MS-24	
C66	390	500	A190-137	1469-0004		5R5T4		MCB243	MS-34	
C67	390	500	A190-137	1469-0004		5R5T4		MCB243	MS-34	
C68	390	500	A190-137	1469-0004		5R5T4		MCB243	MS-34	Note 5
C69	20	1500	A19172					MCP410	60GAB-Q1	
C70	10	2500	A19146					PT615	6TM-S5	
C71	.05	600	A194-160	P688-05	DF-503	PTE6S5		PT601	6TM-P1	
C72	.1	600	A194-162	P688-1		PTE6P1		PT611	6TM-S1	
C73	.05	600	A194-160	P688-05		PTE6S5		PT615	6TM-S5	
C74	500	20000	A1998-3	HV20C	TV3-501	MM-C20T5	413-501		20DK-T5	Note 6
C75	.01	600	A19106	6892GXY-01		PJ6S1		PT611	6TM-S1	
C76	.01	600	A19106	6892GXY-01		PJ6S1		PT611	6TM-S1	

Note 1. Not used in all Models.
Note 2. On Models using turret type tuner this item is part of tuner.
Note 3. Used only with Vert. Osc. Trans. part #PB10125.
Note 4. Some Models use .1MFD in this application (Part #A194-66)
Note 5. Chassis 110,700-100 and 110,700-104 use 270 MMF in this application (Part #A190-133)
Note 6. Models having 17" picture tubes use Part #A1998-2 in this application.
Note 7. Items C44, C45, C46, R42, R43, R44 may be combined in one unit (Part #PB20152).
♦ Items C50A, C50B, C50C, R54A, R54B, R54C are combined in one unit.
Some Models may use separate items, C50A (A194-151) 005, C50B (A194-155) 01, C50C (A194-151) 005.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω	½	A24124	QJ-231*	RTV-305	SBB-684-S	UP152L	Contrast-Panel
B	250KΩ	½					UR254A †	Volume-Rear
C	Switch						US-26	Attach to R1B
R2	20Ω	2	A24118	W20X10	RTV-98	SVT-901	R20CT	Vert. Centering-Wire Wound
R3A	2500Ω	4	A24113	4WS-2500	A10-2500	SVP-988	TVF143	Focus-Wire Wound-Note
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R3A
R4A	100Ω	2	A24116	W-100	A43-100	VK-121	R100L	Horiz. Centering-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R4A
R5A	100KΩ	½	A24110	QJ1-128	AG-49-S	AB-40	SU-41	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	1 Meg	½	A24112	QJ1-137	AG-61-S	AB-69	SU-54	Vert. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	5 Meg	½	A24111	QJ1-141	AG-85-S	AB-87	SU-67	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	3000Ω	½	A24114	WX-3000	A43-3000	AB-8	U-8	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R8A

* CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B17-110 & P1-106 (Panel)
B13-130 & R1-126 (Rear) & SWITCH 76-1.
† UNIVERSAL REPLACEMENT (MALLORY EXACT DUPLICATE PART NO. UE1108).
Note. Chassis No. 110.700-104 uses alternate control (Part No. A24112).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R9	2200Ω	½	A231-1157	BTS-2200	
R10	2200Ω	1	A231-1157	BTS-2200	
R11	220KΩ	½	A231-2305	BTS-220K	
R12	15KΩ	½	A231-2277	BTS-15K	
R13	15KΩ	½	A231-2277	BTS-15K	
R14	4700Ω	½	A231-1165	BTS-4700	
R15	3.3Meg	½	A231-1233	BTS-3.3Meg	Note 4
R16	5600Ω	½	A231-1167	BTS-5600	
R17	39Ω	½	A231-1115		
R18	330Ω	½	A231-1137	BTS-330	
R19	22KΩ	½	A231-1181		
R20	82Ω	½	A231-1123	BTS-82	
R21	8200Ω	1	A232-1171		
R22	82Ω	½	A231-1123	BTS-82	
R23	82Ω	½	A231-1123	BTS-82	
R24	1 Meg	½	A231-1221	BTS-1 Meg	
R25	82Ω	½	A231-1123	BTS-82	
R26	82Ω	½	A231-1123	BTS-82	
R27	4700Ω	½	A231-1165	BTS-4700	
R28	82Ω	½	A231-1123		
R29	4700Ω	½	A231-1165	BTS-4700	
R30	3300Ω	1	A232-1161	BTA-3300	
R31	1 Meg	½	A231-1221	BTS-1 Meg	
R32	560Ω	½	A231-1143	BTS-560	
R33	120Ω	½	A231-1127	BTS-127	
R34	4700Ω	2	A233-1165	BTB-4700	Note 1
R35	270KΩ	½	A231-1207	BTS-270K	
R36	470KΩ	1	A232-1213	BTA-470K	
R37	8200Ω	½	A231-1171	BTS-8200	
R38	100KΩ	½	A231-1197		
R39	100KΩ	½	A231-1197		
R40	1800Ω	½	A231-1155	BTS-1800	
R41	47KΩ	½	A231-1189	BTS-47K	
R42	10 Meg	½	A231-2345	BTS-10 Meg	Note 5
R43	470KΩ	½	A231-1213	BTS-470K	Note 5
R44	470KΩ	½	A231-1213	BTS-470K	Note 5
R45	330Ω	1	A232-1137	BTA-330	
R46	3250	7	A2134-4	1 3/4A-3500	
R47	1800Ω	½	A231-1155	BTS-1800	
R48	220KΩ	½	A231-1205	BTS-220K	
R49	1 Meg	½	A231-1221	BTS-1 Meg	
R50	3300Ω	½	A231-1161	BTS-3300	
R51	8200Ω	½	A231-1171	BTS-8200	
R52	5600Ω	½	A231-1167	BTS-5600	
R53	27KΩ	½	A231-1183	BTS-27K	
R54A	22KΩ	½		BTS-22K	
B	8200Ω	½	♦PB-20150	BTS-8200	
C	8200Ω	½		BTS-8200	
R55	1.5Meg	½	A231-1225	BTS-1.5Meg	
R56	470KΩ	½	A231-1213	BTS-470K	
R57	47KΩ	½	A231-1189	BTS-47K	
R58	3900Ω	½	A231-1163	BTS-3900	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R59	1.5Meg	½	A231-1225	BTS-1.5 Meg	
R60	1000Ω	½	A231-1149	BTS-1000	
R61	47KΩ	1	A232-1189	BTA-47K	
R62	150KΩ	1	A232-1201	BTA-150K	
R63	330ΩΩ	2	A233-1161	BTB-3300	
R64	3300Ω	2	A233-1161	BTB-3300	
R65	8200Ω	½	A231-1171	BTS-8200	
R66	100KΩ	½	A231-1197	BTS-100K	
R67	100KΩ	½	A231-1197	BTS-100K	
R68	3.3Meg	½	A231-2133	BTS-3.3Meg	
R69	2700Ω	½	A231-1159	BTS-2700	
R70	4700Ω	½	A231-1165	BTS-4700	
R71	470KΩ	½	A231-1213	BTS-470K	
R72	5600Ω	½	A231-1167	BTS-5600	
R73	1800Ω	½	A231-1155	BTS-1800	
R74	100KΩ	½	A231-1197	BTS-100K	
R75	220KΩ	½	A231-1205	BTS-220K	
R76	470KΩ	½	A231-1213	BTS-470K	
R77	82Ω	½	A231-1123		
R78	150Ω	2	A233-1129	BW-2-150	Note 2
R79	2.2Ω	½	A23159		
R80	82Ω	½	A231-1123	BTS-82	Note 4
R81	4700Ω	2	A233-1165	BTB-4700	
R82	4700Ω	2	A233-1165	BTB-4700	
R83	60Ω	10	A2134-2		Note 3
R84	1.2Ω	1	A23151		
R85	2500Ω	15	A2134-3	2D-2500	Note 6

Note 1. Some models use a 5600Ω resistor in this application.
Note 2. Omitted in chassis 110.700-120, -140, -150.
Note 3. Some models use a 75Ω resistor or two 60Ω resistors in series in this application.
Note 4. Not used in all models.
Note 5. Items R42, R43, R44, C44, C45, C46 may be combined in one unit. (Part No. PB-20152).
♦ Items R54A, R54B, R54C, C50A, C50B, C50C are combined in one unit.
Some models may use seperate items R54A (A231-1181) 22KΩ, R54B (A231-1181) 22KΩ, R54C (A231-1171) 8200.
Note 6. When continuous tuner is used R85 is 2000Ω.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA PART No.
T1	117VAC	700VCT	5VAC	6.3VAC	A-10109	P-8163 ①	P-3069		R-47BS	
	② 1.78A	.200ADC	②3A	② 7.9A						
				Sec. 4						
				6.3V AC						
				② 1.2A						

① Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA PART No.	NOTES
T2	160Ω	950Ω	A-10106	A-8111	A-300	TBO-2 ②	A-97X ③	206T2 ②	Vert. Osc. Trans.
			A-10134 ①						
T3	405ΩTap	19Ω Tap	PBI0125 ④						
	② 55Ω	② 1Ω, 13Ω	A-10135	A-8130 ⑤ ⑥ ⑦	HVO-10 ⑤	TFB-12 ⑤	D-14 ⑤ ⑧	213T1 ⑧ ⑦	Horiz. Output Trans.
		SEC 2	A-10104 ④						
		0Ω							
T4	1300Ω	9Ω	A-10115-4	A-8112	A-3036	TSO-8	A-99X ③		Vert. Output Trans.
T5A	13Ω		A-28302-1E	DY-8A	MDP-70	TY-2 ①	Y-12	206DI ①	Horiz. Deflection Coils
B	65Ω		A-28302-1 ⑨						Vert. Deflection Coils
			A-28278-3 ①						
T6	1030Ω		A-28295-2C						EM-PM Focus Coil
			A-28282 ⑫						
			A 28295-2 ⑫						
T7	27Ω		A-28292	WC-5 ⑫	MWC-1 ⑫	TWL-1	WC-11 ⑫	212RI	Horiz. Lin. Coil.
T8	1Ω		A-28279-1		MWC-2 ⑫	TW-2		201R4	Width Coil

① Used on chassis 110.700-100, -104
② Mount on top of chassis.
③ Drill one new mtg. hole.
④ Alternate trans.
⑤ Drill new mtg. holes.
⑥ Use with width coil WC-5.
⑦ Wire as shown on replacement installation schematic No. 4 & 5A.
⑧ Use with width c oil. WC-11.
⑨ Alternate deflection yoke.
⑩ Used on chassis 110.700-100, 104
⑪ Use orginal deflection coil network.
⑫ Alternate focus coil.
⑬ Focus coil used on chassis 110,700-120, -140,
⑭ Enlarge mtg. hole.
⑮ Use as in original circuit.
⑯ See instruction sheet packed with unit for terminal connections.
⑰ Use as width coil 213R1. Connect across term #4 & #5.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T9	4.1KΩ	3.4Ω	345Ω	.74Ω	A28286	A-3877 ①	A-3026	RO-9 ①	S-3X ①	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5"	PM	3.4Ω	PC-5866	ST-105 Mod. P5-X	5A07	

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.200A	63Ω	1.57HY	A-1406	C-2325 ①	C-2996 ①	TR-1515 ①	C-21X ①

① Drill one new mtg. hole.

SILVERTONE MODELS 1117-17, 1130-17, 1130A-17, 1141-20, 1145-20, 1162-17, 1172-17, 1173-20, 1181-20, 1183-21, 1188-20, 2100, 2150 (Ch. 110.700-100, -104, -120, -140, -150)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	SILVERTONE PART No.	MILLER PART No.	IRC PART No.	
L2	Ant. Trans.	0Ω CT	0Ω	A28280-14			High Band
L3	Ant. Trans.	0Ω CT	0Ω	A28280-15			Low Band
L4	Ant. Coils	0Ω					
L5	RF Coil	0Ω					Channel 13
L6	RF Coils	0Ω					
L7	Mixer Grid Coil	0Ω					Channel 13
L8	Mixer Grid Coils	0Ω					
L9	Osc. Plate Coil	0Ω CT		A28280-3			Channel 13
L10	Osc. Coils	0Ω					
L11	1st. Video IF	.6Ω		A28280-19	6189 ■		
L12	2nd. Video IF	.1Ω		A3392	6188 ■		
L13	Fil. Choke	.27Ω		A28276	6175	CL-1	.82 Microhenry
L14	3rd. Video IF	.1Ω		A3392	6189 ■		
L15	Fil. Choke	.27Ω		A28276	6175	CL-1	.82 Microhenry
L16	4th. Video IF	.1Ω		A3392	6188 ■		
L17	RF Choke	2.8Ω		A28253			
L18	Series Peaking Coil	9.5Ω		A28255-2	6180		194 Microhenries
L19	Shunt Peaking Coil	5Ω		A28255-1	4644		130 Microhenries
L20	Series Peaking Coil	9.5Ω		A28255-2	6180		194 Microhenries
L21	Shunt Peaking Coil	5Ω		A28255-1	4644		130 Microhenries
L22	Series Peaking Coil	7Ω		A28255-1	4644		130 Microhenries
L23	Shunt Peaking Coil	9.5Ω		A28255-4			314 Microhenries
L24	Sound IF	1.8Ω		A28286	1470		
L25	Ratio Det.	5.5Ω	1.8ΩCT	A1201 *	6205		Tertiary Winding -.7Ω
L26	Horiz. Osc.	60Ω		A28263	6210		

* Alternate part #A1202
■ Enlarge mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1A	RF Tuner	A54946	TT3-TT3X (Less Tubes)
B	RF Tuner	A541114	TT5AL (Less Tubes)
C	RF Tuner	A54805	Turret Type (Less Tubes)
D	RF Tuner	A54900	Continuous Type (Less Tubes)
M2	Ion Trap	A3206	
B2	Trimmer	A1772	Horiz. Drive (25-280MMF)
	Knob	PA39220	Vert. Hold
	Knob	PC39209-2	Channel Selector
	Knob	PC39212-2	Fine Tuning
	Knob	PC30211-2	Off/On Volume
	Knob	PC39213-2	Contrast

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of the RF Tuner Oscillator Adjustments, it is necessary to remove the chassis from the cabinet (See disassembly instructions.)

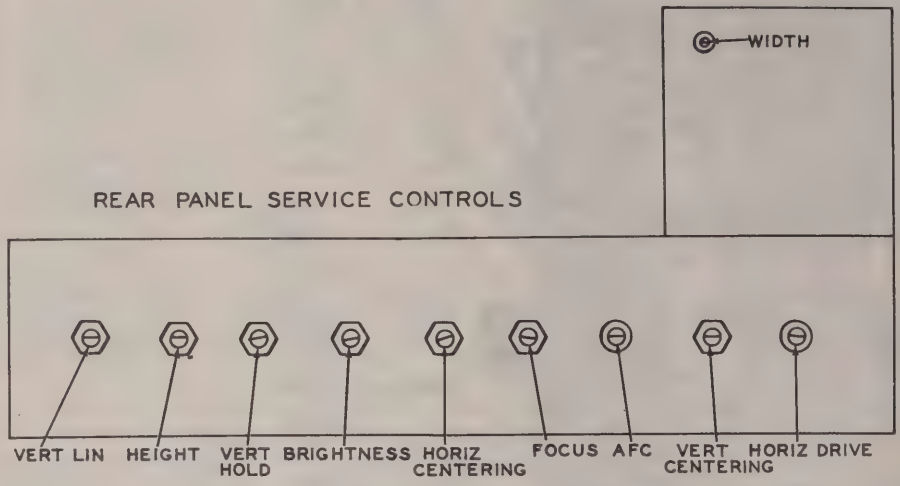
PICTURE TUBE SAFETY GLASS CLEANING

For safety glass cleaning, remove 8 metal screws and 4 clamps and remove safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. AFC slug (L26) can be made from rear of chassis. For location see rear panel service control chart above.

SOUND DETECTOR BUZZ ADJ.

To eliminate Sound IF Detector buzz, adjust the Ratio Detector Secondary (L25) located on top of chassis. (See tube placement chart)

CENTERING

Vert. and Horiz. centering can be accomplished by electrical centering controls, located on rear of chassis. For location see rear panel service control chart above.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 16 metal screws. Remove rear cover.
3. Remove 2 metal screws. Remove antenna bracket.
4. Disconnect speaker. Remove 2 speaker nuts. Remove speaker.
5. Remove 4 chassis bolts. Remove chassis.

PROPERTY OF

SILVERTONE MODELS
2200, 2202, 2203 (Ch. 528.229)

SILVERTONE MODELS
2200, 2202, 2203 (Ch. 528.229)

TRADE NAME	Silvertone Models 2200, 2202, 2203 (Ch. 528.229).
SUPPLIER	Sears Roebuck & Co., 925 S. Homan, Chicago, Illinois.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Five)	Types: 1U4 RF Amp., 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	105-120 volts AC-DC (or) 9 volts "A" supply & 90 volts "B" supply in pack form.
RATING	.12 Amp. @ 117 volts AC (or) 66 MA @ 9 volts DC & 16MA @ 90 volts DC.
TUNING RANGE—BROADCAST	540-1610 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher then necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer turn tuning gang fully closed and set pointer to last index dot at left end of dial back plate.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V2). Low side to B-.	455KC (400~ Mod)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4.	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	High side to stator plates of antenna section of tuning gang. Low side to B-.	1610KC	"	"	A5	Adjust for maximum output.
3.	"	"	1400KC	Tune to 1400KC signal.	"	A6	"
4.		Loop.	1400KC	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

SILVERTONE
MODEL 2200 (Ch. 528.229)

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Silvertone PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	INSTALLATION NOTES
V1	RF Amplifier	1U4	1U4	6AR	
V2	Converter	1R5	1R5	7AT	
V3	IF Amplifier	1U4	1U4	6AR	
V4	Det-AVC-AF Amp.	1U5	1U5	6BW	
V5	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: Silvertone PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▬80	150	T18-305	AFH4-37					R1311	
B	■30	150		PRS25/250						
C	▲300	25								
C2	16	150	T18-306	PRS150/16		BR1615		TC44	TVA-1409	
C3	.05	200	T16-152	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C4	10	500	T15-186	1409-00001		5R5Q1		MCB215	MS-45	
C5	10000		T15-211	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C6	5000		T16-177	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C7	.1	200	T16-157	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C8	100	500	T15-188	1468-0001	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C9	.05	200	T16-152	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C10	5000		T16-177	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C11	50	500	T15-175	1468-00005	D6-500	5W5Q5	GP1K-500	MC225	1FM-45	
C12	.02	400	T16-150	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C13	5000		T16-177	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C14	.002	600	T16-198	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C15	.05	200	T16-152	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C16	.05	400	T16-179	P488-05		PTE4S5		PT415	4TM-S5	
C17	.05	400	T16-179	P488-05		PTE4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: Silvertone PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	T24-202	Q13-137	AG-63-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A.

RESISTORS

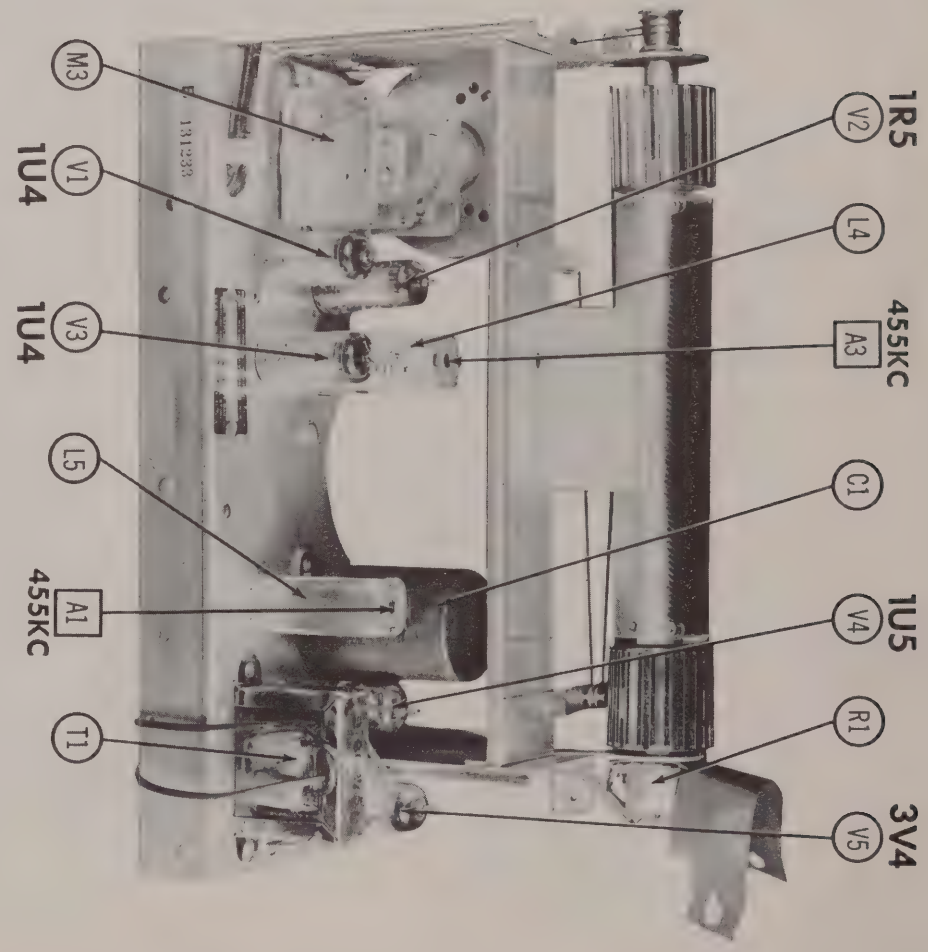
ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: Silvertone PART No.	IRC PART No.	NOTES
R2	4.7Meg	½	T60-779	BTS-4.7Meg	
R3	1500Ω	½	T60-729	BTS-1500	
R4	680Ω	½	T60-708	BTS-680	
R5	22KΩ	½	T60-744	BTS-22K	
R6	100KΩ	½	T60-727	BTS-100K	
R7	10Meg	½	T60-728	BTS-10Meg	
R8	470Ω	½	T60-770	BTS-470	
R9	2.2Meg	½	T60-726	BTS-2.2Meg	
R10	47KΩ	½	T60-730	BTS-47K	
R11	10Meg	½	T60-728	BTS-10Meg	
R12	4.7Meg	½	T60-779	BTS-4.7Meg	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: Silvertone PART No.	IRC PART No.	NOTES
R13	1Meg	½	T60-668	BTS-1Meg	
R14	15KΩ	½	T60-783	BTS-15K	
R15	4700Ω	½	T60-759	BTS-4700	
R16	1500Ω	½	T60-729	BTS-1500	
R17	18KΩ	½	T60-777	BTS-18K	
R18	1Meg	½	T60-668	BTS-1Meg	
R19	330Ω	½	T60-704	BTS-330	
R20	100KΩ	½	T60-727	BTS-100K	
R21	100Ω	3	T60-796		
R22	1000Ω	1	T60-703	BTA-1000	
R23	2000Ω	10	T60-879	1-3/4A-2000	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA: Silvertone PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	9.87KΩ	2.9Ω	438Ω	2.9Ω SEC. 2 22.6Ω	80-275					

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Silvertone PART No.	VIKING PART No.	QUAM PART No.	
SP1	5 x 7"	PM	3.2Ω	79-402	57J9	57A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	Silvertone PART No.	MILLER PART No.	
L1	Loop Ant.	.5Ω		T82-75		Used with green cabinet; maroon cabinet uses Part No. T82-75.
L2	RF Coil	11Ω	11Ω	T10-535		
L3	Osc. Coil	6.5Ω	12Ω	T10-553		
L4	Input IF	19Ω	19Ω	T10-508	12-C1	
L5	Output IF	19Ω	19Ω	T10-508	12-C2	

SELENIUM RECTIFIER

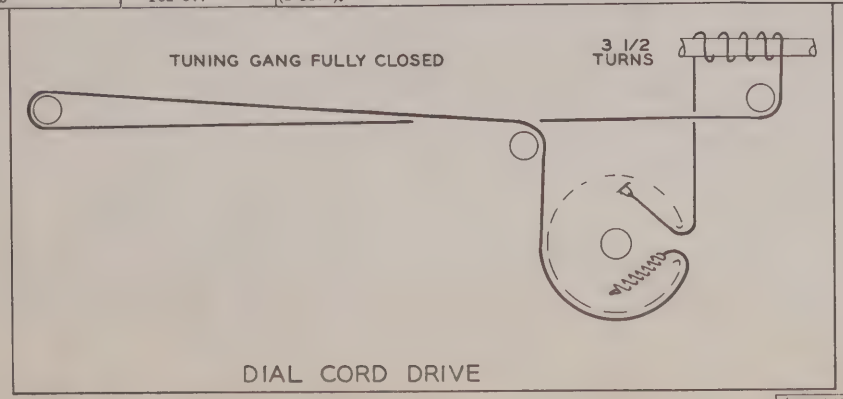
ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	Silvertone PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.063A	T83-642	NA5	5M4	1002A	6S65	65

BATTERIES

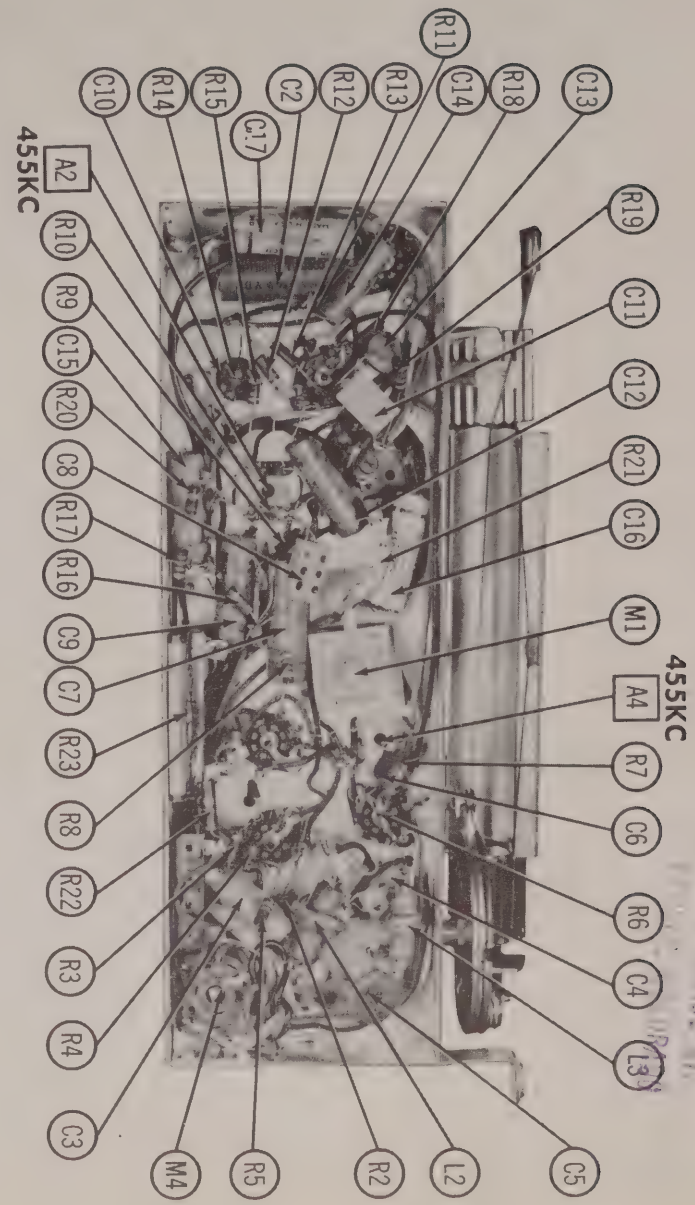
ITEM No.	VOLTAGE	Silvertone PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	9 volt "A" & 90 volt "B"	6407			753			F6A60	

MISCELLANEOUS

ITEM No.	PART NAME	Silvertone PART No.	NOTES
M3	Tuning Capacitor	T19-221	19-323MMF, 12-213MMF, 9-82MMF.
M4	Switch	T69-186	Power Selector.
	Case	T84-674	Complete, Model 2200.
	Case	T84-688	Complete, Model 2202.
	Case	T84-690	Complete, Model 2203.
	Cover	T84-675	Complete, Model 2200.
	Cover	T84-689	Complete, Model 2202.
	Cover	T84-691	Complete, Model 2203.
	Cover	T21-180	Dial Opening
	Crystal	T48-62	
	Scale	T67-570	
	Pointer	T58-94	
	Knob	T52-377	(2 Used).

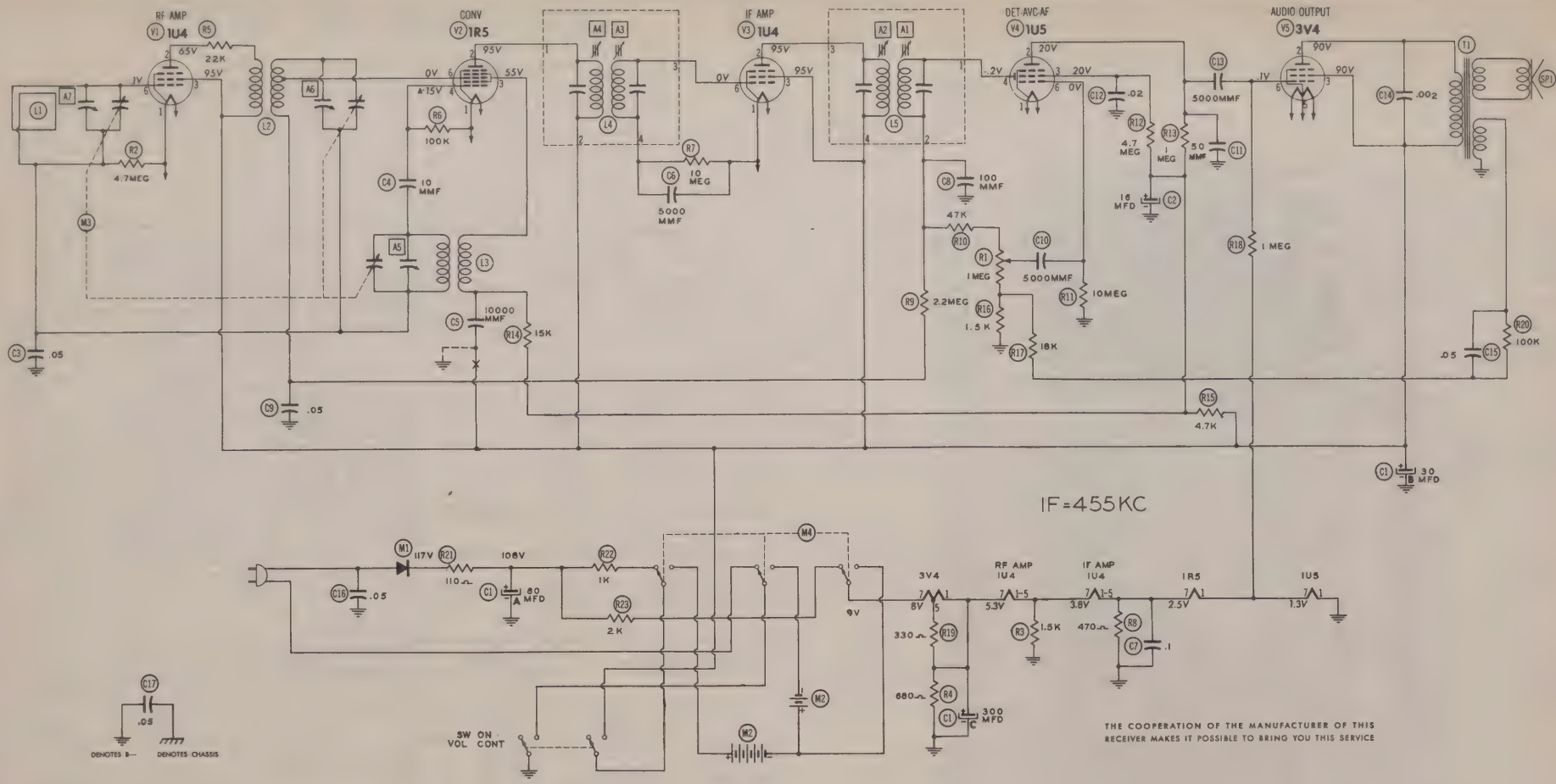


CHASSIS—BOTTOM VIEW



SILVERTONE MODEL 2200 (Ch. 528.229)

SILVERTONE MODEL 2200 (Ch. 528.229)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1U4	*	† 23KΩ	† 1.1KΩ	3.2Meg	*	4.7Meg	*
V 2	1R5	*	† 1.1KΩ	† 21KΩ	100KΩ	*	3.2Meg	*
V 3	1U4	*	† 1.1KΩ	† 1.1KΩ	INF	*	10Meg	*
V 4	1U5	*	† 1Meg	† 4.7Meg	1Meg	INF	10Meg	*
V 5	3V4	*	† 1.5KΩ	† 1.1KΩ	INF	*	1Meg	*

† MEASURED FROM OUTPUT OF M1.
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

SPARTON MODELS 5240, 5241, 5280, 5281 (Ch. 21S212), 5301 (Ch. 21S173-D), 5340, 5341, 5380, 5381 (Ch. 21S213)

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MODEL 5301

SPARTON MODELS 5240, 5241, 5280, 5281 (Ch. 21S212), 5301 (Ch. 21S173-D), 5340, 5341, 5380, 5381 (Ch. 21S213)

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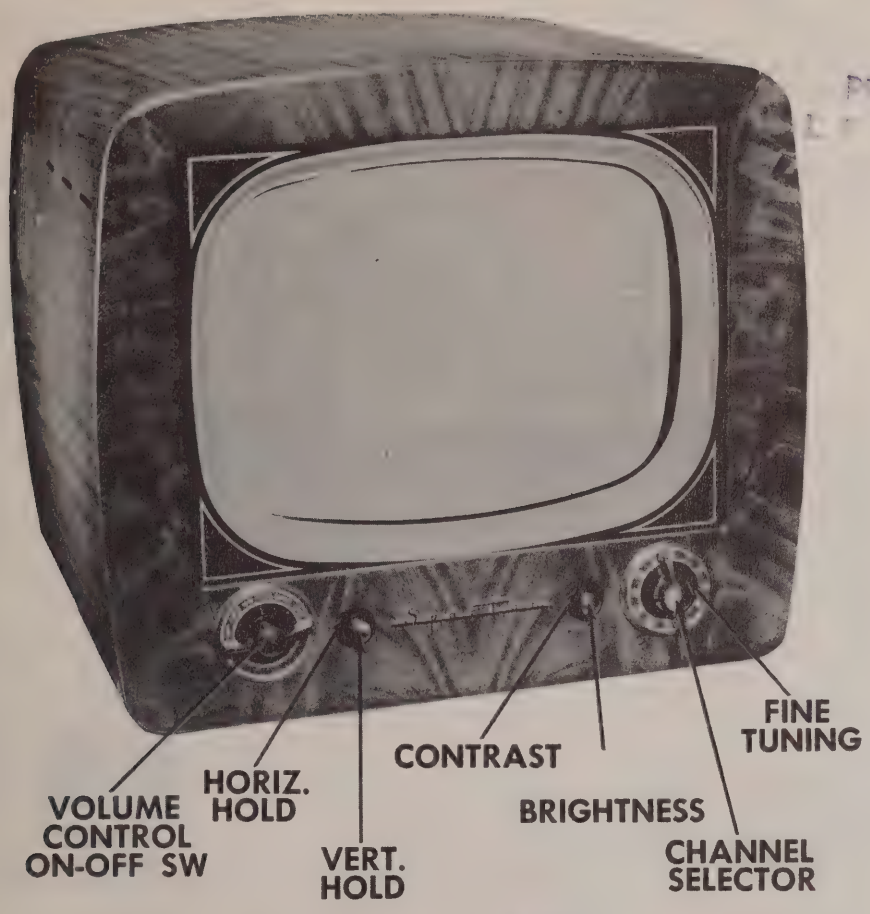

SPARTON MODEL 5301

TRADE NAME	Sparton Models 5240, 5241, 5280, 5281 (Ch. 21S212) 5301 (Ch. 21S173-D) 5340, 5341, 5380, 5381 (Ch. 21S213).
MANUFACTURER	Sparks Withington Co., Jackson, Mich.
TYPE SET	Television Receiver
TUBES	Twenty- One
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.74 Amp @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 26.25MC, Sound IF 21.75MC (Intercarrier).

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SPARTON MODELS 5240, 5241, 5280, 5281 (Ch. 21S212), 5301 (Ch. 21S173-D), 5340, 5341, 5380, 5381 (Ch. 21S213)

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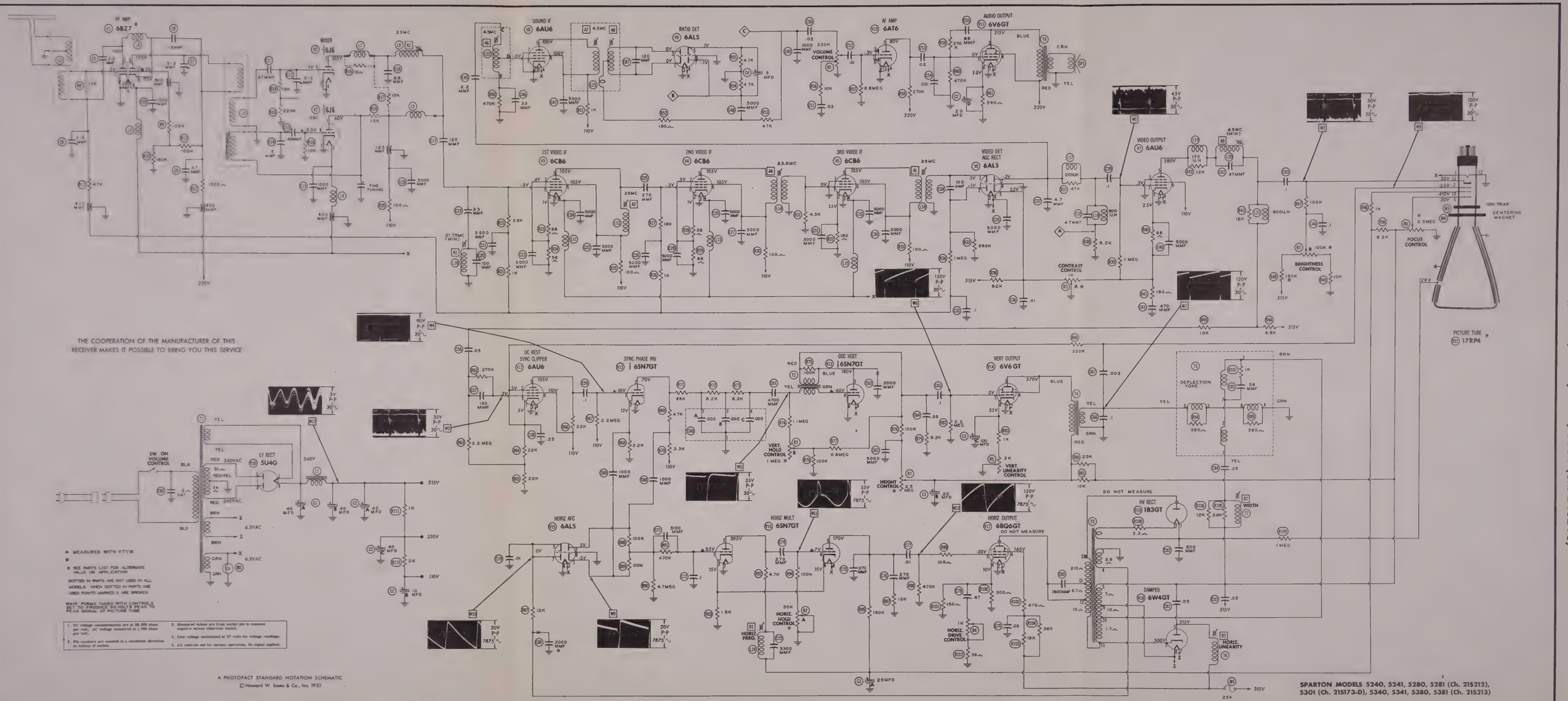
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
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SPARTON MODELS 5240, 5241, 5280, 5281 (Ch. 215212), 5301 (Ch. 215173-D), 5340, 5341, 5380, 5381 (Ch. 215213)
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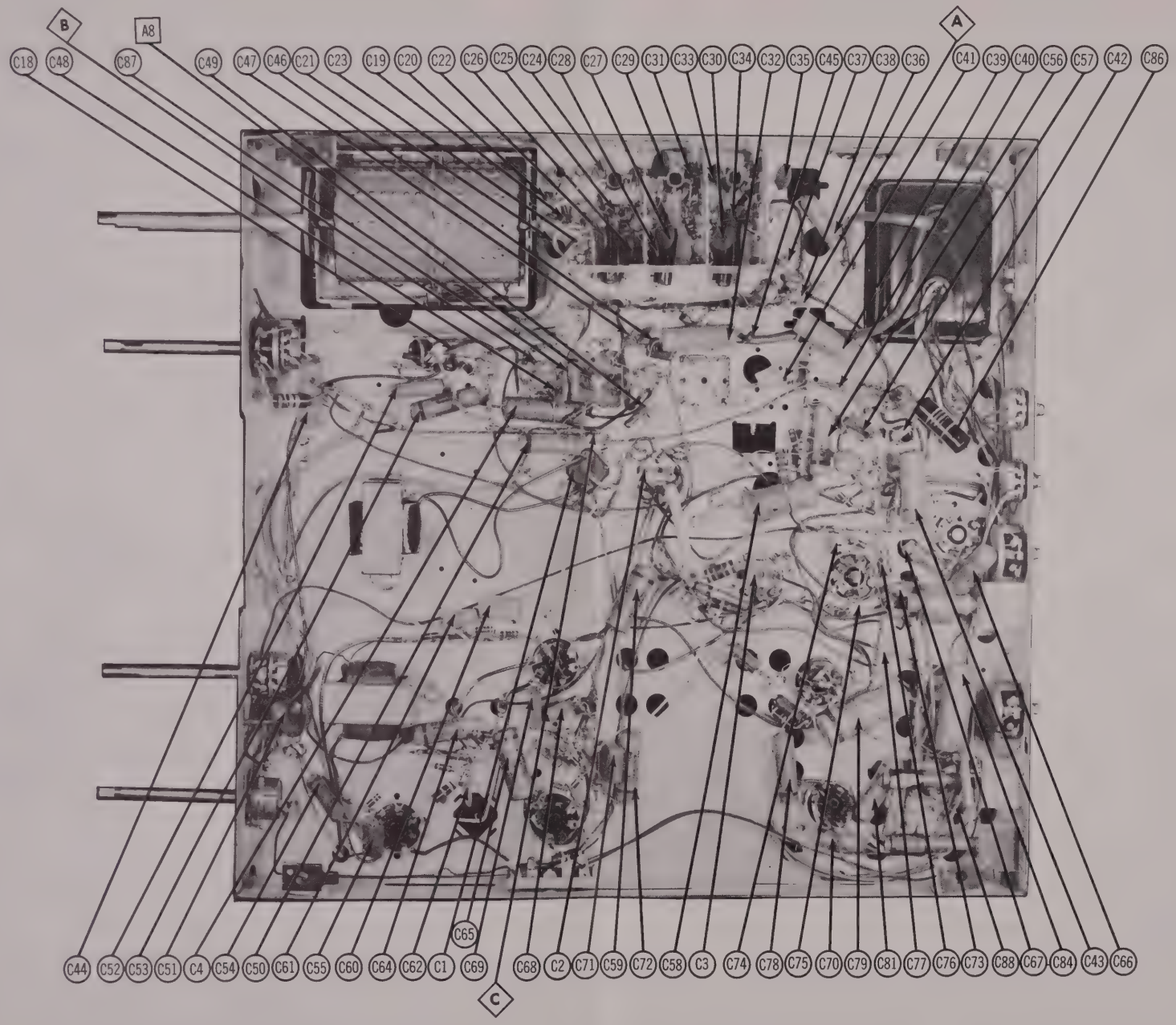
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

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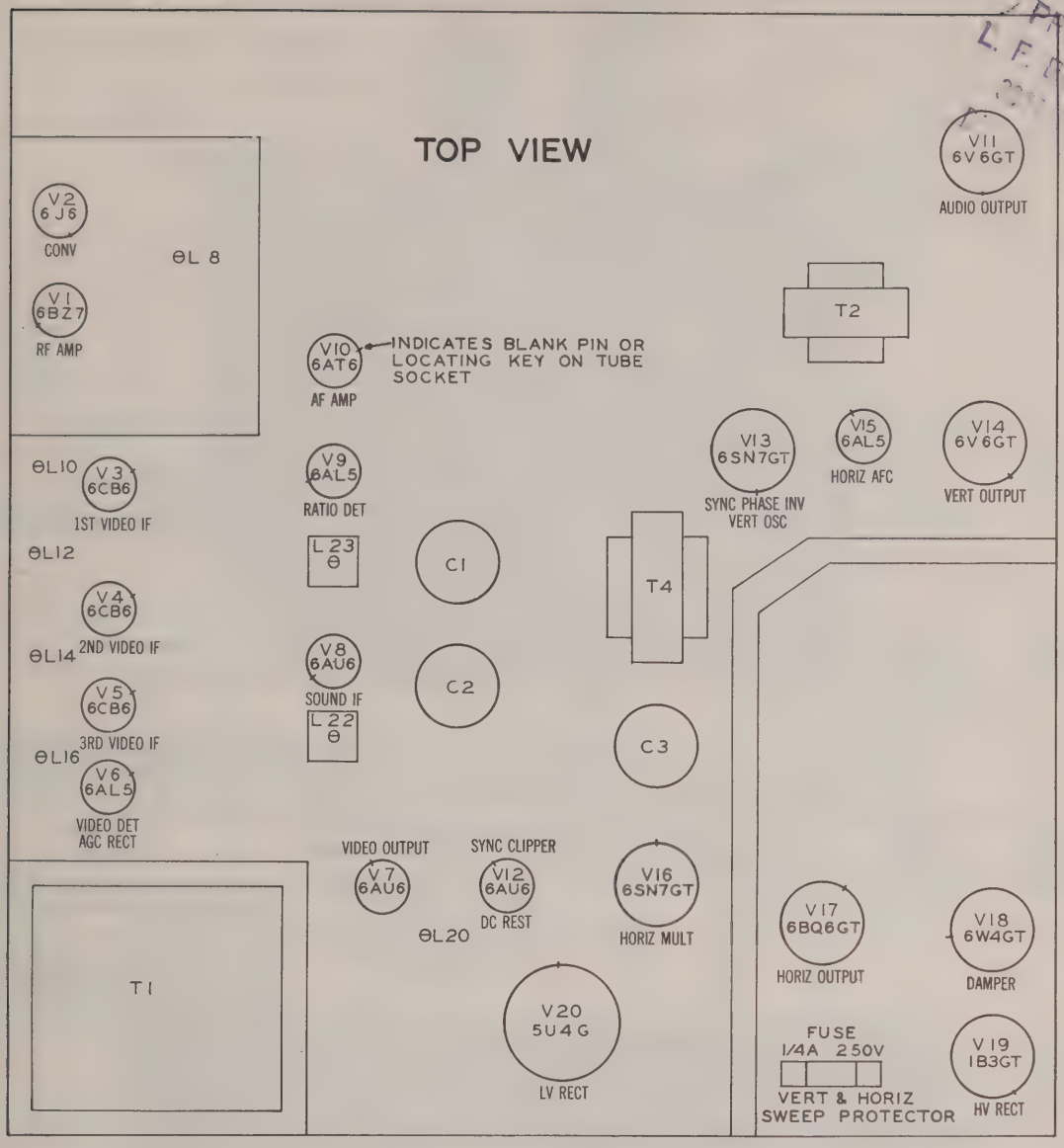
TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound-V20

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster-V2, V3, V4, V5, V6
No pic, no sound, has snow-V1, V2, V3
No pic, has sound, has raster-V7, V21
Has pic, no sound-V8, V9, V10, V11
Overloaded picture-V6

SYNC FAILURE
No vert. sync.-V13
No horiz. sync.-V13, V15, V16
No vert. or horiz. sync.-V12, V13

SWEEP FAILURE
No raster, has sound-V16, V17, V18, V19, V21 Fuse (M1)
No vertical deflection-V13, V14
Poor vert. linearity or foldover-V13, V14
Poor horiz. linearity or foldover-V16, V17, V18
Narrow picture-V16, V17, V18, V19, V20
Vert. off freq.-V13
Horiz. off freq.-V13, V15, V16

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removal of the horizontal multivibrator tube (V16) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C32. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	Highs side to an ungounded tube shield floating over dummy converter tube (V2). Low side to chassis.	21.75MC (Unmod)	Any	DC probe to point (A) Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	23MC	"	"	A2	Adjust for maximum deflection.
3.	"	"	25MC	"	"	A3	"
4.	"	"	23.8MC	"	"	A4	"
5.	"	"	26MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Leave the 3 volt bias battery connected as under Video IF Alignment.
Connect a 47KΩ resistor in series with the high lead to the vertical amplifier of the scope. Connect a 50MMF capacitor across the input terminals of the vertical amplifier.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	24.5MC (10MC Swp)	23.25MC 24MC 25.5MC 26.25MC	Any	Vert amp. thru 47KΩ to point (A) Low side to chassis.		Check for response curve similar to Fig. 1. If necessary retouch A2 thru A5 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 of 6AL5 (V6). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B) Common to chassis.	A6, A7	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (C) Common to chassis.	A8	Adjust for a zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 of 6AL5 (V6). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp to point (B) Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C4. Adjust for curve of maximum amplitude and symmetry as per Fig. 2.
8.	"	"	"	"	"	Vert. amp to point (C) Low side to chassis.	A8	Reconnect capacitor C4. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to pin 1 (grid) of 6AU6 (V7). Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru crystal diode detector (Fig. 4) to pin 11 of picture tube Common to chassis.	A9	Adjust for MINIMUM deflection.

THE TUNER PORTION OF THIS RECEIVER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD. IF THE TUNER IS DEFINITELY KNOW TO BE MIS-ALIGNED RETURN THE ENTIRE TUNER TO THE FACTORY.

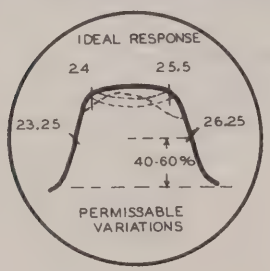


FIG. 1

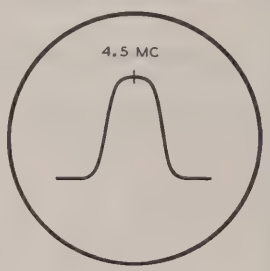


FIG. 2

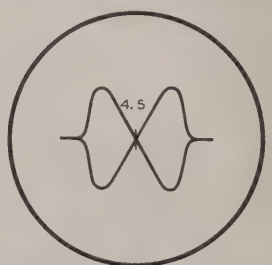


FIG. 3

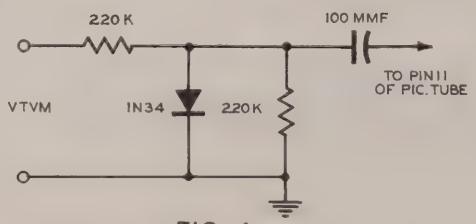
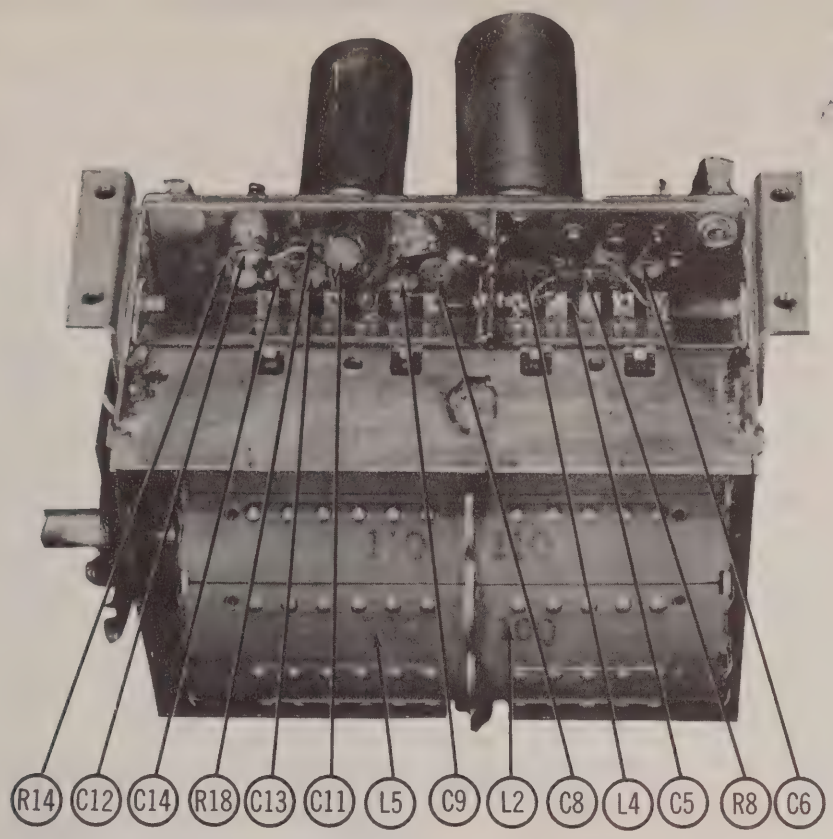
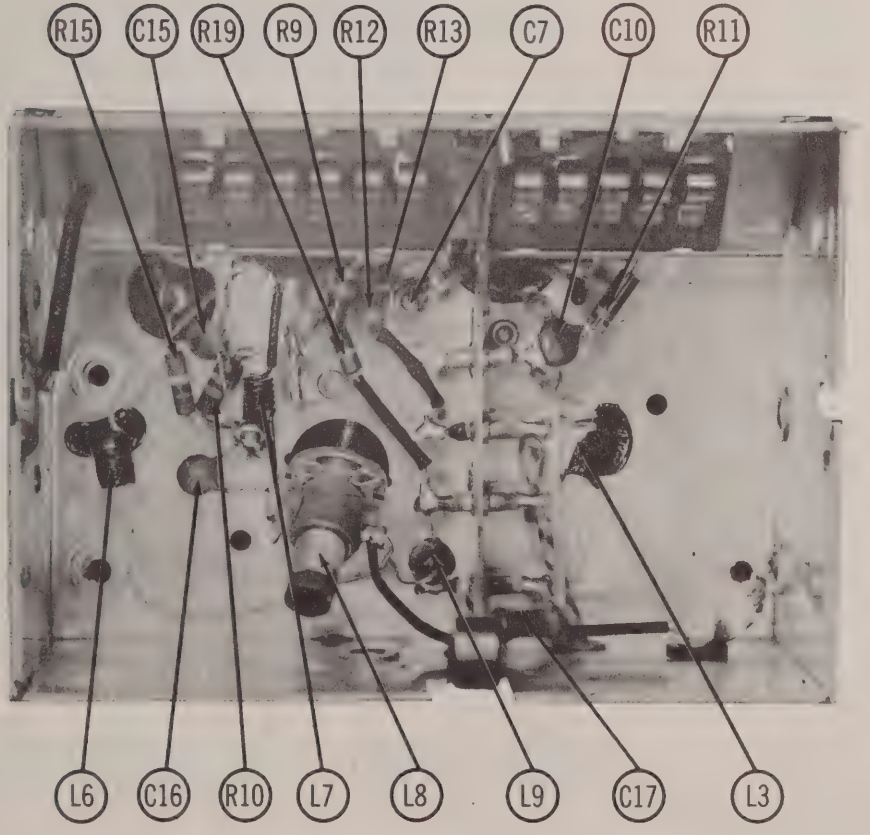


FIG. 4

PROPERTY OF
L. I. G. ANTIQUE SHOP



RF TUNER-RIGHT SIDE



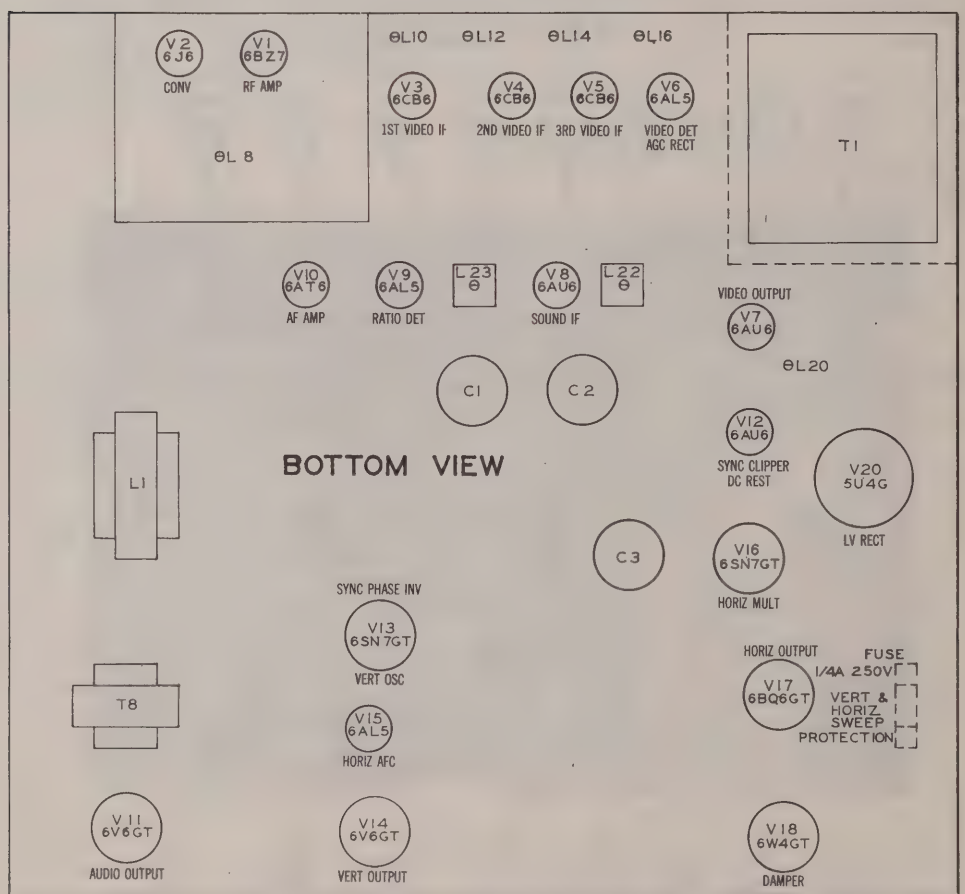
RF TUNER-BOTTOM VIEW

RESISTANCE MEASUREMENTS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	INF	1.7Meg	0Ω	.1Ω	0Ω	†2.5KΩ	†160KΩ	INF	0Ω
V 2	6J6	†18KΩ	†3.2KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	1.7Meg	124Ω	0Ω	.1Ω	†3.2KΩ	†3.2KΩ	56Ω		
V 4	6CB6	1.7Meg	124Ω	0Ω	.1Ω	†3.2KΩ	†3.2KΩ	68Ω		
V 5	6CB6	.2Ω	180Ω	0Ω	.1Ω	†3.2KΩ	†3.2KΩ	0Ω		
V 6	6AL5	.2Ω	680KΩ	0Ω	.1Ω	900Ω	0Ω	8.2KΩ		
V 7	6AU6	1 Meg	0Ω	0Ω	.1Ω	†6.9KΩ	†3.1KΩ	140Ω		
V 8	6AU6	470KΩ	0Ω	0Ω	.1Ω	†4.1KΩ	†4.1KΩ	0Ω		
V 9	6AL5	INF	INF	0Ω	.1Ω	4.7KΩ	0Ω	4.7KΩ		
V 10	6AT6	6.8Meg	0Ω	0Ω	.1Ω	INF	INF	†270KΩ		
V 11	6V6GT	INF	.1Ω	†1.4KΩ	†1.1KΩ	470KΩ	740KΩ	0Ω	390Ω	
V 12	6AU6	2.4Meg	44KΩ	0Ω	.1Ω	†25KΩ	†3.1KΩ	44KΩ		
V 13	6SN7GT	†2.2Meg	†11KΩ	2.2KΩ	1.8Meg	#800KΩ	0Ω	0Ω	.1Ω	
V 14	6V6GT	INF	.1Ω	#7.3KΩ	#7.3KΩ	2.2Meg	INF	0Ω	1.8KΩ	
V 15	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	12KΩ	0Ω	12KΩ		
V 16	6SN7GT	5.1Meg	#13KΩ	1.5KΩ	130KΩ	#180KΩ	1.5KΩ	0Ω	.1Ω	
V 17	6BQ6GT	†12KΩ	0Ω	INF	†12KΩ	470KΩ	470KΩ	.1Ω	100Ω	Top Cap #10Ω
V 18	6W4GT	INF	INF	240KΩ	INF	†116Ω	INF	#12Ω	#12Ω	
V 19	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap #226Ω
V 20	5U4G	INF	50KΩ	#9.2KΩ	34Ω	INF	31Ω	5Ω	50KΩ	
V 21	17RP4	.1Ω	370KΩ	Pin 6 150KΩ	Pin 10 #9.2KΩ	Pin 11 150KΩ	Pin 12 0Ω			

† MEASURED FROM PIN 8 OF V20.
# MEASURED FROM PIN 3 OF V 18.



TUBE PLACEMENT CHART

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF Tuner Oscillator Circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

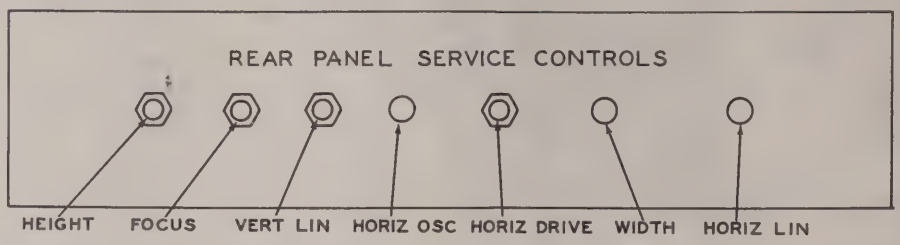
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis . Set the Horiz. Hold Control at the mid-position of its range and adjust the Horiz. Osc. slug until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector buzz, adjust the Ratio Detector Secondary L23 located on bottom of chassis. (See tube placement chart). Wire screen is removable from bottom of cabinet.

FUSES

One fuse is used for Horiz. Sweep Circuit protection. (See tube placement chart for location).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

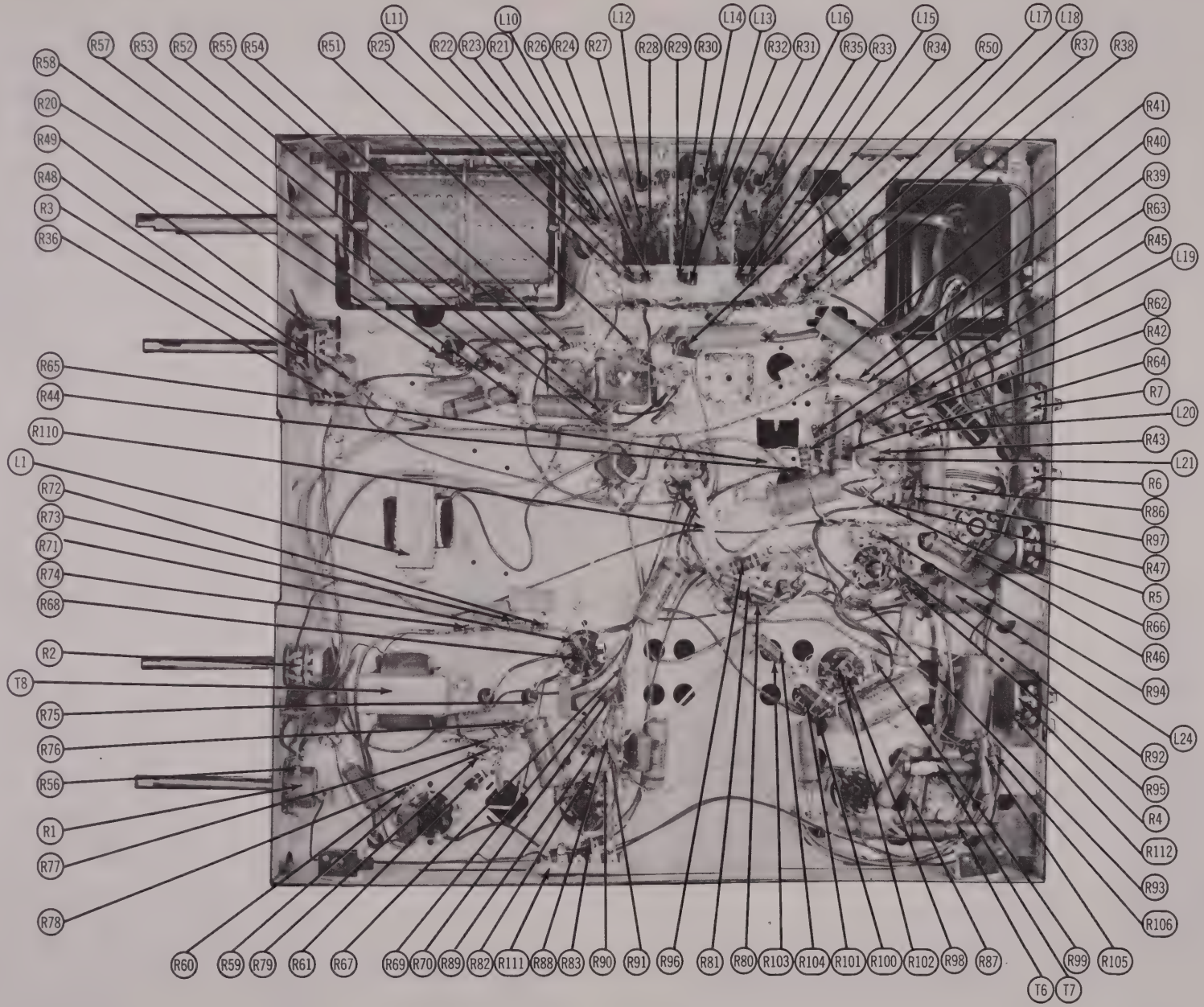
① Remove 8 push on type control knobs from front panel.

② Remove 6 wood & 1 metal screws. Remove rear cover.

③ Disconnect built-in antenna. Remove 2 wood screws. Remove antenna brkt.

④ Disconnect 2 speaker leads. Remove 2 speaker nuts. Remove speaker.

⑤ Remove 4 chassis bolts. Remove chassis.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP:

Check yoke for open. Check T7 for open.
Check C84 for open.

INSUFFICIENT SWEEP:

Check setting of horizontal drive control, horizontal linearity, (B3, and width, (B2).
If adjustment of (B2), (B3), and horizontal drive do not correct this trouble, check wave form at W12.

If Satisfactory	If Unsatisfactory
Substitute V17 and V18. Check T3 and other components associated with V17 and V18	Substitute V16. Check associated circuit components.

DRIVE LINES:

Check setting of horizontal drive control.
Substitute V17 and V18. Check C75, C76 and C79.

FOLDS:

Substitute V18. Check C81 and C82.

XMAS TREE EFFECT:

Check C73 for short. Check L24 for short.

VERTICAL

LOSS OF SWEEP:

Substitute V13 and V14. Check waveform at W6.

If Satisfactory	If Unsatisfactory
Check C66, T4 and yoke.	Check C65, R83 and R5 for open. Check T2 for open or shorted winding.

INSUFFICIENT SWEEP:

Check waveform at W6.

If Satisfactory	If Unsatisfactory
Substitute V14. Check C3B and C66 for leakage.	Substitute V13. Check C64, C62 and other components of the vertical oscillator circuit.

COMPRESSED AT BOTTOM:

Substitute V14. Check C3C and C65.

COMPRESSED AT TOP:

Substitute V14. Check components associated with V14. Check T4.

FOLDS:

Substitute V14. Check C65 for leakage.

SYNC

HORIZONTAL

LOSS OF SYNC:

Substitute V12, V13 and V15. Check waveform at W9.

If Satisfactory	If Unsatisfactory
Check components associated with V15.	Check C69, C68 and other components associated with V12 and V13A.

CRITICAL SYNC:

Substitute V12, V13, V15 and V16.

VERTICAL

LOSS OF SYNC:

Substitute V12 and V13. Check signal at W5.

If Satisfactory	If Unsatisfactory
Check C61 and other components associated with V13B.	Check vertical integrator network and components associated with V12 and V13A.

CRITICAL SYNC:

Substitute V12 and V13. Proceed as outlined under Vertical, Loss of Sync.

TRIGGERING:

Substitute V13. Check components associated with V13B. Check filament dress near vertical oscillator and sync tubes.

VIDEO

SOUND BARS:

Check adjustment of 4.5MC trap, (A9). Check adjustment of local oscillator.

POOR RESOLUTION:

Substitute V1, V2, V3, V4 and V5. Check components of the video IF strip for change of value.
Check alignment as outlined in the alignment table.

POOR CONTRAST:

Substitute V6 and V7. Check components associated with V6 and V7.
Check bypass capacitors associated with V3, V4, V5, V6 and V7.

SMEAR:

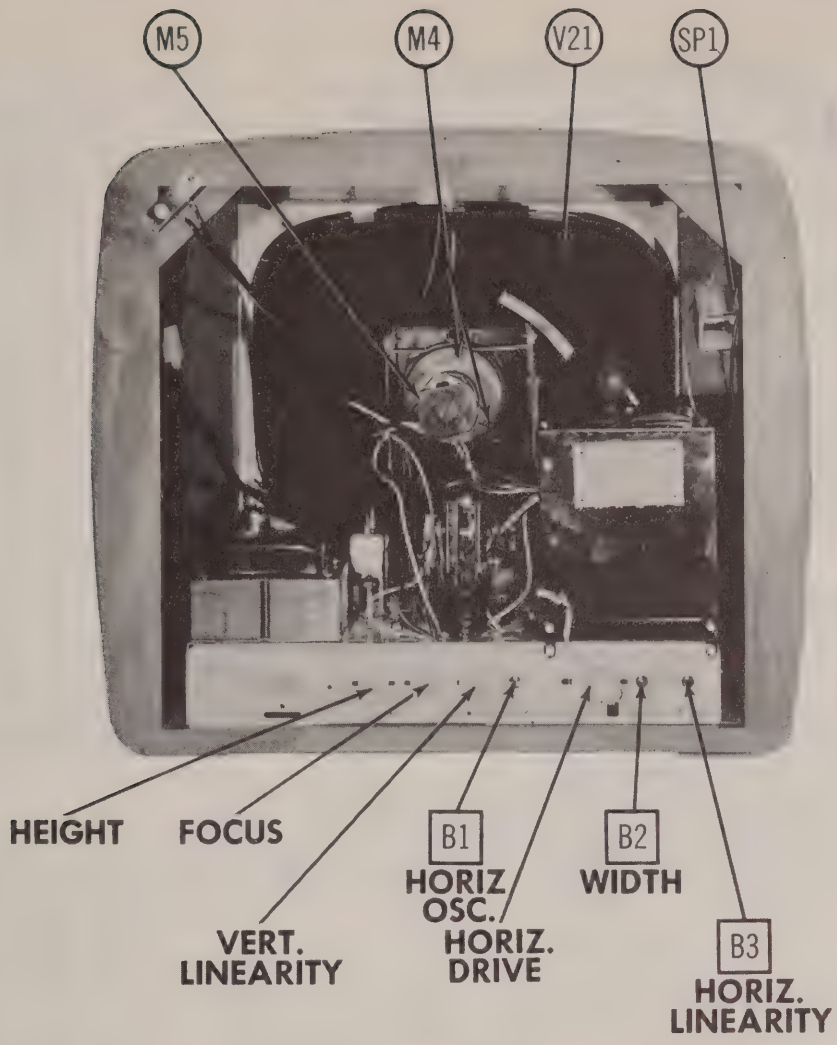
Substitute V6 and V7. Check peaking coils L17, L18, L19 and L21 for open. Check R44 and R45 for change of value. Check video coupling capacitors C39 and C43.

ONE WIDE BLACK BAR ACROSS PICTURE:

Check RF tuner, video IF and video tubes for heater to cathode leakage.

TWO WIDE BLACK BARS ACROSS PICTURE:

Check L1 for short. Check filter capacitors C1 and C2 for open.



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the mid-point of its range and adjust the horizontal oscillator slug (B1) until the picture synchronizes horizontally.

Turn the horizontal drive control to the maximum clockwise rotation without compression of the center of the picture.

Adjust the width slug (B2) for a picture slightly wider than enough to fill the picture mask.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6BZ7	6BZ7	9AJ	
B	RF Amplifier	6BQ7	6BQ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Detector - AGC Rectifier	6AL5	6AL5	6BT	
V7	Video Output	6AU6	6AU6	7BK	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amplifier	6AT6	6AT6	7BT	
V11	Audio Output	6V6GT	6V6GT	7S	
V12	Sync. Clipper - DC Restorer	6AU6	6AU6	7BK	
V13	Sync. Phase Inv. - Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V14	Vert. Output	6V6GT	6V6GT	7S	
V15	Horiz. AFC	6AL5	6AL5	6BT	
V16	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V17	Horiz. Output	6BQ7GT	6BQ7GT	6AM	
V18	Damper	6W4GT	6W4GT	4CG	
V19	RV Rectifier	1B3GT	1B3GT	3C	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: SPARTON PART No	REPLACEMENT DATA: SYLVANIA PART No	RMA BASE TYPE	NOTES
V21A	17RP4	17RP4	12C	
B	17HP4	17HP4	12C	
C	17KP4		12C	
D	21FP4A	21FP4A	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	475	PA4307-13	AFH2-72		BO45		FP262	TVL-2830	
B	▲40	475								
C2A	▲40	450	PA4307-27	AFH4-84		DO65		FP429	TVL-4736	
B	▲10	350								
C	▲40	400								
D	20	25								
C3A	▲20	450	PA4307-30	AFH4-80		DO63		FP437	TVL-4740	
B	▲20	450								
C	100	50								
C4	5	50	PA4308-2	PRS150/4		BR550		TC30	TVA-1303	
C5	2.2				TCZ-2.2		NP0K-2R2		5TCCB-V22	
C6	3.9				829-10					
C7	3.3				829-3			CT565A		
C8	1.5			SII5.NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C9	47			BPD-000047	D6-470	TM5Q5	GP1K-470	UC-5447	5GA-Q47	
C10	100			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C11	47			BPD-000047	D6-470	TM5Q6	GP1K-470	UC-5447	5GA-Q47	
C12	3-3				829-3			CT565A		
C13	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C14	5			SI5N750	TCN-5		N750K-050	NT-555	5TCU-V5	
C15	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C16	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C17	120			SII20	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C18	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C19	3.3		PA4326-4	SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C20	100		PA4332-3	SI100NP0	TCZ-100		NP0-333-101	ZT-531	5TCC-T1	
C21	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C22	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C23	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C24	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C25	270		HK36M-271	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C26	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C27	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C28	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C29	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C30	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C31	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C32	.1	200	PC40GK-104	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C33	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C34	100		HK36M-101	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C35	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C36	.01	400	PC40GL-103	P488-01	D6-103	PT8481	GP2-333-103	PT411	4TM-S1	
C37	4.7		PA4328-11	SI4.7NP0	TCZ-4.7		NP0K-4R7	ZT-555	5TCCB-V47	
C38	4.7		PA4328-11	SI4.7NP0	TCZ-4.7		NP0K-4R7	ZT-555	5TCCB-V47	
C39	.1	200	PC40HK-104	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C40	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C41	470	500	MC50F-471	1468-0005	D6-471	5W5T5	GP2K-471	MC245	1FM-35	
C42	47		CC30A-470F	SI47NP0	TCZ-47		NP0K-470	ZT-5447	5TCC-Q47	
C43	.1	400	PC40HL-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C44	.1	200	PC40HK-104	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C45	2.2		PA4326-1		TCZ-2.2		NP0K-2R2		5TCCB-V22	
C46	33	500	MC50E-330							
C47	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C48	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C49	1000		HK36M-102	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C50	.02	400	PC40HL-203	P488-02	DF-203	PTE482		PT412	4TM-S2	
C51	.03	200	PC40GK-303	P488-03		PTE483		PT413	4TM-S3	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C52	.01	400	PC40HL-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C53	.02	600	PC40HM-203	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C54	.001	600	PC40GM-102	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C55	68	500	MC80E-680	1469-00007	D6-680	5W5Q7	GP1K-680	UC-5468	5GA-Q68	
C56	.05	400	PC40GL-503	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C57	150	500	MC60F-151	1468-00015	D6-151	5W5T15	GP2K-151	MC236	1FM-315	
C58	.25	200	PC40HK-254	P488-25		PTE4P25		PT4025	2TM-P25	
C59	.1	400	PC40GL-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C60A	.002			P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
B	.005		PA4339-4	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C	.005			P688-005	D6-502	PTE5D5	GP2-333-502	PT625	6TM-D5	
C61	4700	500	MC61F-472	1464-005		1DR5D5		MCB465	MS-25	
C62	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C63	2000	500	MC61E-202	1464-002		1DR5D2		MCB457	MS-22	
C64	.05	400	PC40GL-503	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C65	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C66	.1	200	PC42GK-104	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C67	.003	600	PC40GM-302	P688-003	D6-302	PTE6D3	GP2-333-302	PT623	6TM-D3	
C68	1000	500	MC61E-102	1467-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C69	1000	500	MC61E-102	1467-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C70	.01	400	PC40FL-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C71	5100	500	MC61E-512							
C72	.1	200	PC40FK-104	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C73	3300	500	MC63F-332							
C74	270	500	MC60E-271							
C75	270	500	MC60E-271							
C76	270	500	MC60E-271							
C77	.01	400	PC40GL-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C78	.05	400	PC40HL-503	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C79	.47	200	PC42GK-474	P288-47		PTE4P47		PT405	2TM-P47	
C80	1800	500	MC61E-182							
C81	.05	400	PC40GL-503	P488-05		PTE4S5		PT415	4TM-S5	
C82	.05	400	PC40GL-503	P488-05		PTE4S5		PT415	4TM-S5	
C83	500	20000	PA4342-2	HV20C	TV3-502	MM-C20T5	413-501		20DK-T5	
C84	.25	400	PC40GL-254	P488-25		PTE4P25		PT4025	4TM-P25	
C85	56	2000	PA4334-5							
C86	.047	600	PA4346-1	689ZK-05		PJ6S47		PT6147	6TM-S47	
C87	120		PA4332-4		TCZ-120		NP0-333-121			
C88	2000	500		1464-002		1DR5D2		MCB467	MS-22	Note 1

Note 1. Not used in all Models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	330KΩ	½	PA4436-3	Q18-132X	AK-69		UT-425	Volume Tap② 60KΩ-Note 1
B	Shaft		PA4436-4 ①	C3	KS8-5		DS-36	Attach to R1A
C	Switch			76-1	SWB		US-26	Attach to R1A
R2A	250KΩ	½	PA4456-1C	QJ-431*			UF54L	Horiz. Hold -Panel-Note 4
B	1 Meg	½	PA4456 ①				UR16L	Vert. Hold - Rear
R3A	1000Ω	2	PA4458-1	QJ-432**			WF13	Contrast-Wire Wound-Panel-Note 5
B	100KΩ	½	PA4458 ①				UR15L	Brightness-Rear
R4A	10000Ω	2	PA4446	WK-1000	A43-1000		R1000L	Horiz. Drive-Wire Wound
B	Shaft		Not Req.	Not Req.	FK3-1/4		Not Req.	Attach to R4A
R5A	5000Ω	2	PA4411	WK-5000	A43-5000	VK-135	R5000L	Vert. Linearity-Wire Wound
B	Shaft		Not Req.	Not Req.	FK3-1/4	Not Req.	Not Req.	Attach to R5A
R6A	2.5Meg	½	PA4454	Q11-239	AG-84-2	AB-83	SU-565	Focus-Note 2
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R6A
R7A	2.5Meg	½	PA4454	Q11-239	AG-84-8	AB-83	SU-565	Height-Note 3
B	Shaft		Not Req.	Not Req.	FK3-1/4	AK-1	Not Req.	Attach to R7A

① Used only in chassis No. 2I5213.
Note 1. Chassis No. 2I5212 uses alternate control part No. PA4436-1 in this application.
Note 2. Chassis No. 2I5212 uses alternate control part No. PA4452 in this application.
Note 3. Chassis No. 2I5212 uses alternate control part No. PA4431 in this application.
Note 4. Chassis No. 2I5212 uses single controls. Horiz. hold part No. PA4444-3. Vert. hold part No. PA4443-3.
Note 5. Chassis No. 2I5212 uses single controls. Contrast part No. PA4453-1. Brightness part No. PA4445-3.
* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-123 & P2-226 (Panel) B11-127 & R1-306 (Rear).
** CONCENTRIKIT EQUIVALENT - KIT K-3, BASE ELEMENTS & SHAFTS W11-108 & P3-226 (Panel) B11-128 & R1-312 (Rear).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	NOTES
R8	15KΩ	½		BTS-15K	
R9	100KΩ	½			
R10	160KΩ-5%	½		BTS-160K-5%	
R11	47KΩ	½			
R12	1500Ω	½		BTS-1500	
R13	100KΩ-5%	½		BTS-100K-5%	
R14	10KΩ	½			
R15	220KΩ	½		BTS-220K	
R16	10Ω	½			
R17	15KΩ	½			
R18	10KΩ	½			
R19	15KΩ	½			
R20	100Ω	½		BTS-100	
R21	1000Ω	½		BTS-1000	
R22	3900Ω-5%	½		BTS-3900-5%	
R23	68Ω	½			
R24	56Ω	½			
R25	100Ω	½		BTS-100	
R26	1000Ω	½		BTS-1000	
R27	18KΩ-5%	½		BTS-18K-5%	
R28	56Ω	½			
R29	68Ω	½			

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	NOTES
R30	100Ω	½		BTS-100	
R31	4300Ω-5%	½		BTS-4300-5%	
R32	180Ω	½		BTS-180	
R33	100Ω	½		BTS-100	
R34	1 Meg	½		BTS-1 Meg	
R35	680KΩ	½		BTS-680K	
R36	82KΩ	2		BTB-82K	
R37	47KΩ-5%	½		BTS-47K-5%	
R38	8200Ω-5%	½		BTS-8200-5%	
R39	1 Meg	½		BTS-1 Meg	
R40	68Ω	½			
R41	180Ω-5%	½		BTS-180-5%	
R42	12KΩ-5%	½		BTS-12K-5%	
R43	12KΩ-5%	½		BTS-12K-5%	
R44	6800Ω-5%	1		BTA-6800-5%	
R45	10KΩ	½		BTS-10K	
R46	1000Ω	½		BTS-1000	
R47	100KΩ	½		BTS-100K	
R48	150KΩ	½		BTS-150K	Note
R49	10KΩ	½		BTS-10K	
R50	470KΩ	½			
R51	1000Ω	½		BTS-1000	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	NOTES
R52	180Ω-5%	½		BTS-180-5%	
R53	47KΩ	½		BTS-47K	
R54	4700Ω-5%	½		BTS-4700-5%	
R55	4700Ω-5%	½		BTS-4700-5%	
R56	10KΩ	½		BTS-10K	
R57	6.8Meg	½		BTS-6.8Meg	
R58	270KΩ	½		BTS-270K	
R59	270KΩ	½		BTS-270K	
R60	470KΩ	½		BTS-470K	
R61	390Ω	1		BTA-390	
R62	270KΩ	½		BTS-270K	
R63	2.2Meg	½		BTS-2.2Meg	
R64	22KΩ	½		BTS-22K	
R65	22KΩ	½		BTS-22K	
R66	22KΩ	½		BTS-22K	
R67	2.2Meg	½		BTS-2.2Meg	
R68	2200Ω-5%	½		BTS-2200-5%	
R69	4700Ω-5%	½		BTS-4700-5%	
R70	3300Ω-5%	½		BTS-3300-5%	
R71	68KΩ	½		BTS-68K	
R72	8200Ω	½		BTS-8200	
R73	8200Ω	½		BTS-8200	
R74	1.1Meg-5%	½		BTS-1.1Meg-5%	
R75	100KΩ	½		BTS-100K	
R76	100KΩ	½		BTS-100K	
R77	6.8Meg	½		BTS-6.8Meg	
R78	100KΩ	½		BTS-100K	
R79	8200Ω	½		BTS-8200	
R80	20KΩ	1			
R81	10KΩ	2		BTB-10K	
R82	2.2Meg	½		BTS-2.2Meg	

Note : Some models use a 180KΩ resistor in this application.

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	NOTES
R83	1000Ω	1		BTA-1000	
R84	560Ω	½		BTS-560	
R85	560Ω	½		BTS-560	
R86	330KΩ	½		BTS-330K	
R87	12KΩ	2		BTB-12K	
R88	100KΩ	½		BTS-100K	
R89	100KΩ	½		BTS-100K	
R90	4.7Meg	½		BTS-4.7Meg	
R91	470KΩ	½		BTS-470K	
R92	4700Ω-5%	½		BTS-4700-5%	
R93	1500Ω-5%	½		BTS-1500-5%	
R94	100KΩ	½		BTS-100K	
R95	180KΩ-5%	½		BTS-180K-5%	
R96	8200Ω	2		BTB-8200	
R97	10KΩ	½		BTS-10K	
R98	470KΩ	½		BTS-470K	
R99	100Ω	½			
R100	3000Ω-5%	1		BW-1-300-5%	
R101	150Ω	2		BW-2-150	
R102	470Ω	½			
R103	18KΩ	2		BTB-18K	
R104	36KΩ-5%	1		BTA-36K-5%	
R105	5800Ω	2		BTB-5800	
R106	12KΩ	1		BTA-12K	
R107	1000Ω	½		BTS-1000	
R108	3.3Ω	½			
R109	1 Meg	1			
R110	2000Ω	10		1 3/4A-2000	
R111	1000Ω	10		1 3/4A-1000	
R112	39Ω	½			

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA Type No.
T1	117VAC ⑤1.74A	680VCT .210ADC	5VAC ⑤3A	6.3VAC ⑤1.2A SEC. 4 6.3VAC ⑤ 7.4A	AB44027-1		P-3070		R-39BC	

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA Type No.	NOTES
T2	150Ω	820Ω	AB47006-4	A-8111	A-3000	TBO-5 ①	A-97X	208T2 ③	Vert. Osc. Trans.
T3	245Ω tap ④70, 170,18.7Ω 28.7Ω, 35.4Ω	3.9Ω SEC. 2 0Ω	PC70015B						Horiz. Output Trans.
T4	670Ω	6.2Ω	AB44062-5	A-8115 ①	A-3035 ①	TSO-1 ①	A-107X①	204T2 ①	Vert. Output Trans.
T5 A	15Ω		PC70016A	DY-9A	MDF-70	TY-5	Y-21	206D1	Horiz. Deflection Coils
B	90Ω								Vert. Deflection Coils
T6	8Ω		AA6400-5				WC-12	213R1	Horiz. Lin. Coil
T7	5Ω		AA6400-4		MWC-2 ②				Width Coil

① Drill one new mounting hole.
② Enlarge mounting hole.
③ Mount on top of chassis.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T8	6.4KΩ	3.6Ω	261Ω	.32Ω	AB44066-3	A-3823	A-3020	RO-13 ①	S-9Z	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: SPARTON PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3.6Ω	PC63000-43 PC63000-41 ①	ST-105 Mod. P5-X	5A07	① 10" Speaker

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.210A	108Ω	3HY	AB-47009-1		C-2994	TR-3300 ①	C-15X

① Drill one new mounting hole.

SPARTON MODELS 5240, 5241, 5280, 5281 (Ch. 215212), 5301 (Ch. 215173-D), 5340, 5341, 5380, 5381 (Ch. 215213)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	SPARTON PART No.	MILLER PART No.	
L2	Ant. Coils	0ΩCT	0Ω			
L3	Fil. Choke	0Ω				
L4	Neutr. Coil	0Ω				
L5	RF Mixer Grid & Osc. Coils	0Ω				
L6	Fil. Choke	0Ω				
L7	RF Choke	0Ω				
L8	1st Video IF	1.2Ω				
L9	RF Choke	1.5Ω				
L10	Sound Trap	0Ω		AB43523-14	6171	
L11	Fil. Choke	0Ω		AA6651-1		
L12	2nd Video IF	.1Ω		AA6408-1	6188	
L13	Fil. Choke	0Ω		AA6651-1		
L14	3rd Video IF	.2Ω	.2Ω	AA6409-1		
L15	Fil. Choke	0Ω		AA6651-1		
L16	4th Video IF	.2Ω	.2Ω	AA6409-1		
L17	Series Peaking Coil	10Ω		AA6613-4	6180	200 Microhenries.
L18	Shunt Peaking Coil	18.5Ω		AA6613-8	4650	600 Microhenries.
L19	Series Peaking Coil	9.5Ω		AA6613-9	6180	175 Microhenries.
L20	4.5MC Trap	2Ω		AA6407-1	1470	
L21	Shunt Peaking Coil	18.5Ω		AA6613-8		600 Microhenries.
L22	Sound IF	5.8Ω		AA6667-6		Tapped @ 3.2Ω
L23	Ratio Det.	4.8Ω	1.5ΩCT	AA6684-4	6205†	Tertiary Winding .6Ω
L24	Horiz. Osc.	77Ω		AA6410-1	6210	

† Use adaptor plate.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SPARTON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG P/T	1/4A 250V	PA4212-1		318.250 (3AG-1/4A P/T)		GJV 1/4	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					SPARTON PART No.		
M2	Bayonet	6-8	.15	Brown			Type No. 47.

MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M3	RF Tuner	PD93174	
M4	Centering Magnet		
M5	Ion Trap	PA1248-4	
	Knob	AA6392-1	Off/On Volume (Model 5240, 5241, 5280, 5281).
	Knob	PA4436-3	Off/On Volume (Model 5301).
	Knob	AB43596-1	Off/On Volume (Model 5340, 5380).
	Knob	AB43596-2	Off/On Volume (Model 5341, 5381).
	Knob	PB40332	Channel Selector (Model 5240, 5241, 5280, 5281).
	Knob	AB43593-1	Channel Selector (Model 5301).
	Knob	AB43593-1	Channel Selector (Model 5340, 5380).
	Knob	AB43593-2	Channel Selector (Model 5341, 5381).
	Knob	PB40346	Fine Tuning (Model 5240, 5241, 5280, 5281).
	Safety Glass	PB40354-3	Models 5240, 5241, 5280, 5281, 5340, 5341, 5380, 5381.
	Safety Glass	PD93036-1	Model 5301.
	Mask	PD93058	Models 5240, 5241, 5280, 5281, 5340, 5341, 5380, 5381.
	Mask	PD93035-2	Model 5301.

TROUBLE SHOOTING AIDS – CONT.

AUDIO

WEAK OR NO SOUND:

Substitute V8, V9, V10 and V11. Check associated circuit components. Check sound IF alignment and adjustment of ratio detector.

BUZZ:

Check adjustment of ratio detector secondary (A8). If this does not correct troubles substitute V9 and readjust (A8).

DISTORTED:

Substitute V8, V9, V10 and V11. Check audio amplifier and output stages using audio signal generator. If no distortion is present check circuits of V8 and V9. Check associated components.

POWER

SMALL RASTER:

Substitute V20. Check component of B+ circuit.

DIM PICTURE WEAK SOUND:

Substitute V20. Check filter network for leakage of capacitors and shorts.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE:

Substitute V16, V17, V18 and V19. Check waveform at W12.

If Satisfactory	If Unsatisfactory
Check C80, T3 and other components associated with V17, V18 and V19.	Check C74, C75 and C77. Check other components associated with V16.

WEAK HIGH VOLTAGE:

Substitute V16, V17, V18 and V19. Proceed as outlined under LOSS OF HIGH VOLTAGE.

BLOOMING:

Substitute V19. Check R108, R109 and C83. Check high voltage transformer, (T3).

GENERAL

NO PICTURE, NO SOUND, NO SNOW:

Substitute V1 and V6.

WEAK PICTURE, WEAK SOUND: (STRONG SIGNAL AREAS)

Substitute V2, V3, V4 and V5.

SOUND, NO PICTURE:

Substitute V7. Check components of video amplifier stage.

SNOWY PICTURE, GOOD SOUND: (STRONG SIGNAL AREAS)

Substitute V2, V3, V4 and V5. Check components of video IF stages.

INTERMITTANT STREAKS:

Check high voltage section for corona discharge and arcing.

Symptoms shown above are assumed and are not indicative of the quality and workmanship of this receiving equipment.

PROPERTY OF

SUTCO
MODEL 21-A (TV UHF Conv.)

SUTCO
MODEL 21-A (TV UHF Conv.)

TRADE NAME	Sutco Model 21-A
MANUFACTURER	Sutton Electronics Co., Inc., 426 W. Short St., Lexington, Ky.
TYPE SET	AC Operated Television UHF Converter & VHF Booster
TUBES	Types 6AF4 UHF Osc., 6J6 RF IF Amp.
POWER SUPPLY	110-120 Volts AC-50/60 Cycles RATING .13 Amp. @ 117 Volts
TUNING RANGE	VHF - Channels 2thru 13,UHF - Channels 14 thru 83

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

SUTCO MODEL 21-A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	INSTALLATION NOTES
		SUTCO PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	RF IF Amp.	6J6	6J6	7BF	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SUTCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	●125	150				XB006		FP215		
B	▲100	150								
C2	.68				TCZ-.68		NP0K-R68			
C3	.68				TCZ-.68		NP0K-R68			
C4	1				TCZ-1		NP0K-010		5TCCB-V1	
C5	1.2				TCZ-1.2		NP0K-1R2			
C6	1				TCZ-1		NP0K-010		5TCCB-V1	
C7	.5									
C8	.68				TCZ-.68		NP0K-R68			
C9	10			S110N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C10	.68				TCZ-.68		NP0K-R68			
C11	.68				TCZ-.68		NP0K-R68			
C12	1.2				TCZ-1.2		NP0K-1R2			
C13	1.2				TCZ-1.2		NP0K-1R2			
C14	1				TCZ-1		NP0K-010		5TCCB-V1	
C15	56				TCN-56		N750L-560			
C16	56				TCN-56		N750L-560			

RESISTORS

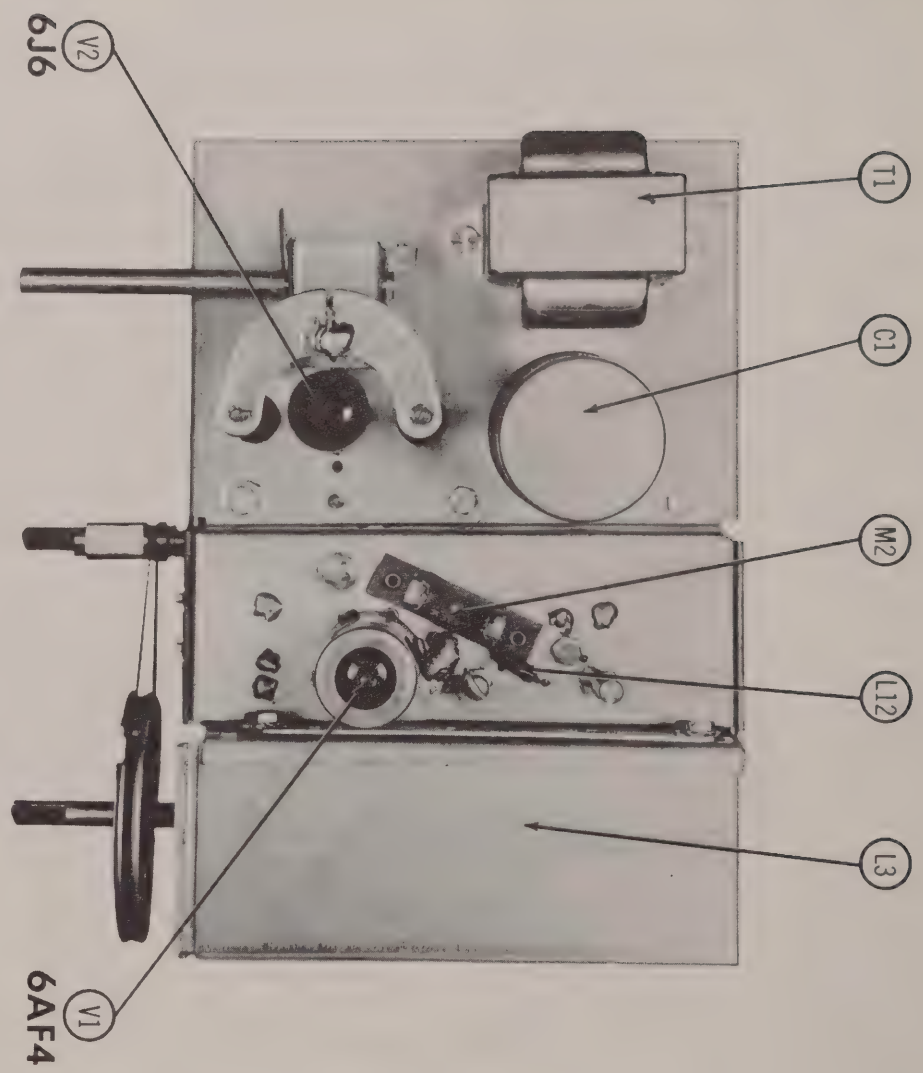
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SUTCO PART No.	IRC PART No.	
R1	12KΩ	½		BTS-12K	
R2	1Meg	½		BTS-1Meg	
R3	4700Ω	½		BTS-4700	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SUTCO PART No.	IRC PART No.	
R4	47Ω	½			
R5	47Ω	½			
R6	560Ω	1		BTA-560	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	SUTCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ .13A	118VAC @ .023ADC tap @ 6.3VAC @ .69A							R-54X

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

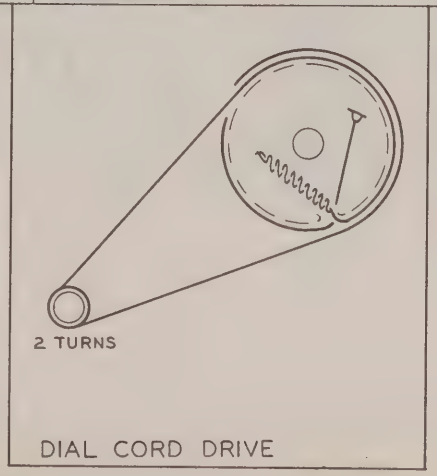
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SUTCO PART No.	REPLACEMENT DATA MILLER PART No.	NOTES
L1	Ant. Impedance Matching Coil	.1Ω				
L2	Ant. Impedance Matching Coil	.1Ω				
L3	Ant. Mixer & Osc. Coils	0Ω				
L4	Ant. Coil End Inductor	0Ω				
L5	Mixer Coil End Inductor	0Ω				
L6	Osc. Coil End Inductor	0Ω				
L7	RF Choke	0Ω				
L8	Cathode Choke	.1Ω				
L9	Fil. Choke	.1Ω				
L10	Fil. Choke	.1Ω				
L11	Fil. Choke	.1Ω				
L12	Parasitic Choke	0Ω				
L13	Parasitic Choke	0Ω				
L14	UHF IF Trans.	0Ω	0Ω			
L15	RF Input Tuning	0Ω				Tapped
L16	RF Output Tuning	0Ω				Tapped

SELENIUM RECTIFIER

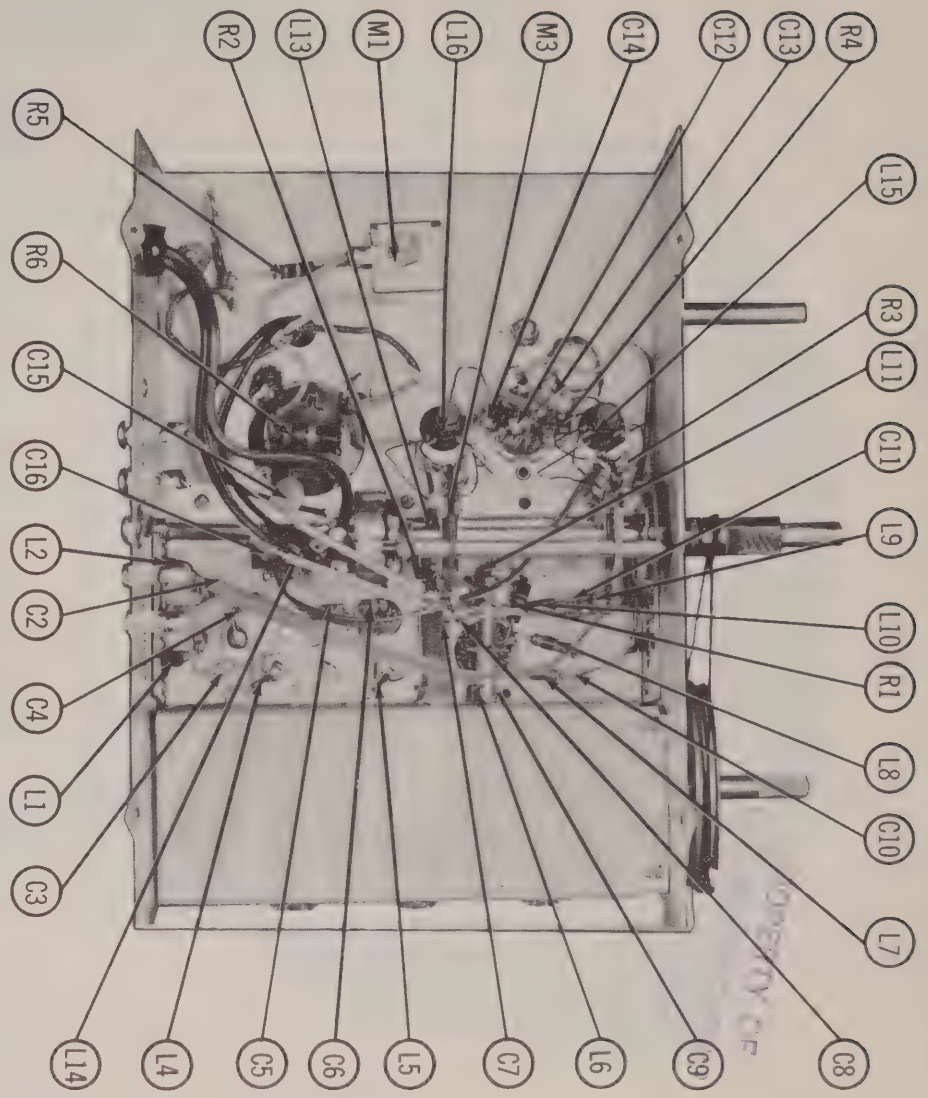
ITEM No.	RATING CURRENT	REPLACEMENT DATA SUTCO PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.023ADC		NA5	8J1	1214A	6S65	35

MISCELLANEOUS

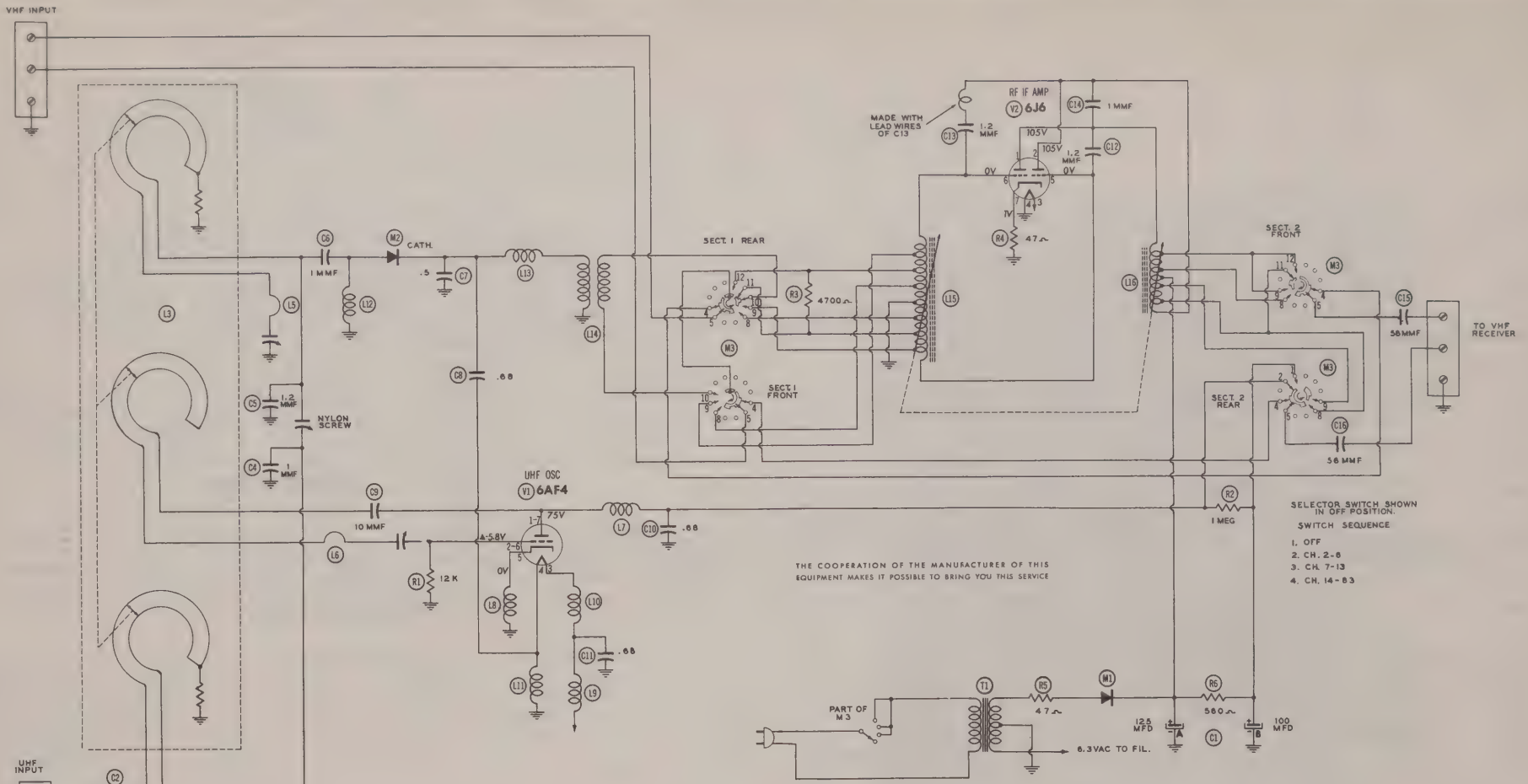
ITEM No.	PART NAME	SUTCO PART No.	NOTES
M2	Crystal Diode		CK710
M3	Switch		Function Selector



CHASSIS—BOTTOM VIEW



SUTCO MODEL 21-A



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6AF4	†560Ω	12KΩ	.2Ω	.7Ω	.1Ω	12KΩ	†560Ω
V 2	6J6	†.1Ω	†.1Ω	.5Ω	0Ω	0Ω	0Ω	47Ω

ALL MEASUREMENTS TAKEN IN UHF POSITION
† MEASURED FROM OUTPUT OF M1
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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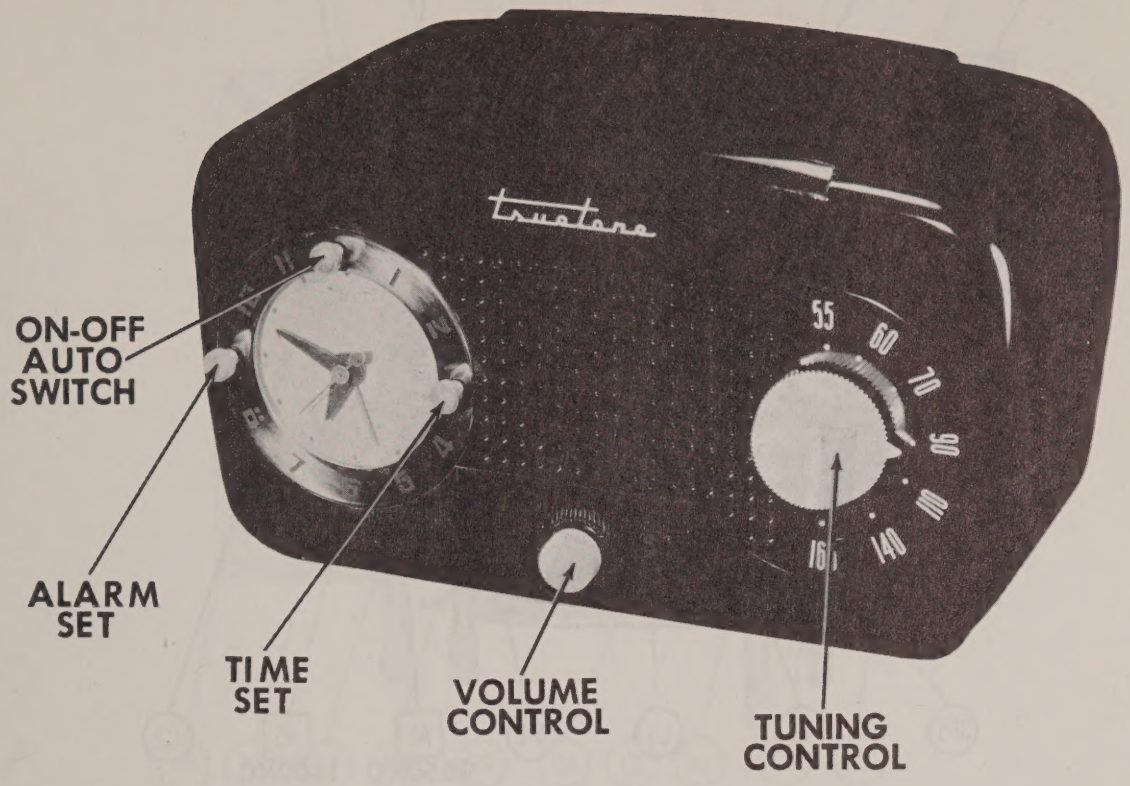
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

TRUETONE
MODEL D-2205



TRUETONE
MODEL D-2205

TRADE NAME	Truetone Model D-2205
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (Four)	Types 12BE6 Conv., 12AT6 - Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycle — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	550-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	45MMF	High side to Ant. terminal on Ant. coil (remove hank). Low side to B-.	1650KC	"	"	A3	"
3.	"	"	1500KC	Tune for maximum output	"	A4	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		TRUETONE PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V3	Audio Output	50C5	50C5	7CV	
V4	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150	31-43	PRS150/40-		EDL4415		2N511	TVA-2445	
B	40	150		40						
C2	.002	600	32-17	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C3	.05	200	32-4	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C4	100	500	35-4	1468-0001	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C5	.002	600	32-17	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C6	10000		35-29	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C7	.01	400	32-29	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C8	.05	400	32-5	P488-05		PTE4S5		PT415	4TM-S5	
C9	.1	400	32-57	P488-1		PTE4P1		PT401	4TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2Meg	½	50-36A	Q13-139	AG-66-Z	AB-76	U-55	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A

RESISTORS

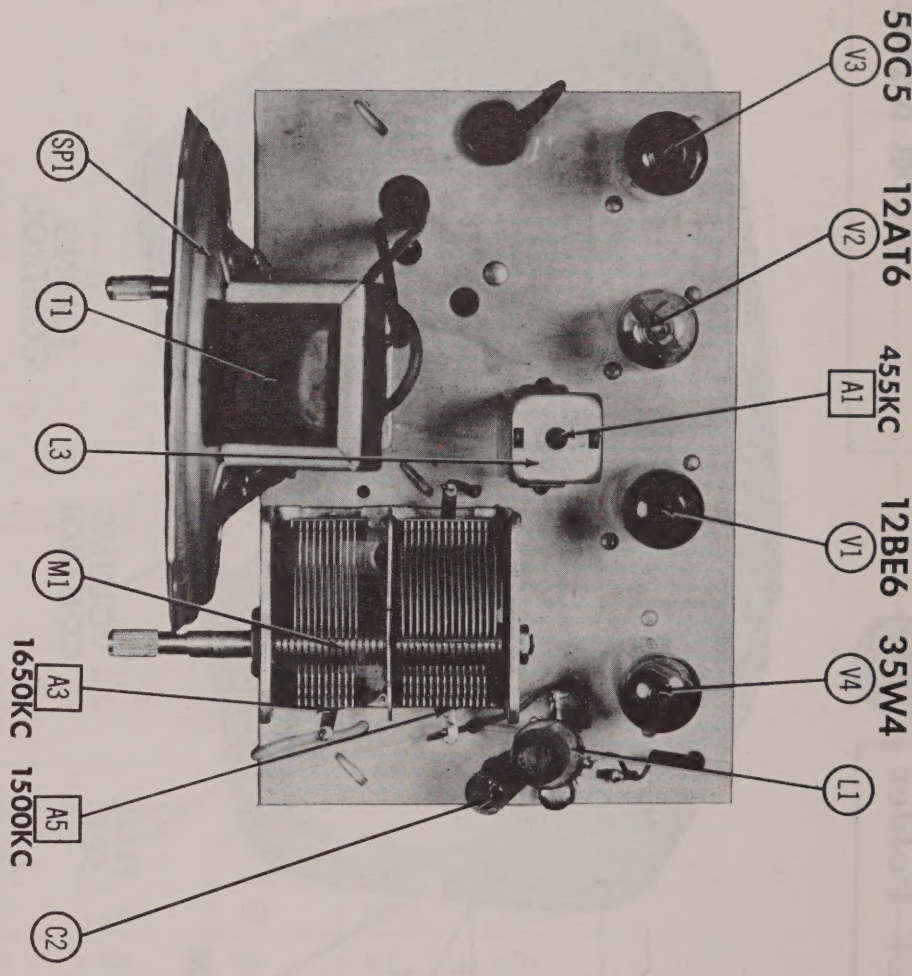
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R2	22KΩ	½	20-223-31	BTS-22K	
R3	4.7Meg	½	20-475-31	BTS-4.7Meg	
R4	10Meg	½	20-106-31	BTS-10Meg	
R5	470KΩ	½	20-474-31	BTS-470K	
R6	470KΩ	½	20-474-31	BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	TRUETONE PART No.	IRC PART No.	
R7	150Ω	½	20-151-31	BTS-150	
R8	1500Ω	1	20-152-41	BTA-1500	
R9	22Ω	½	20-220-31		
R10	22Ω	1	20-220-41		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.7KΩ	3.7Ω	220Ω	.54Ω	Part of Spkr.	A-3332	A-3025	A RO-301①	S-1X ①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.7Ω	80-14C	ST-113 Mod. P 4-X	4A07	

COILS (RF-IF)

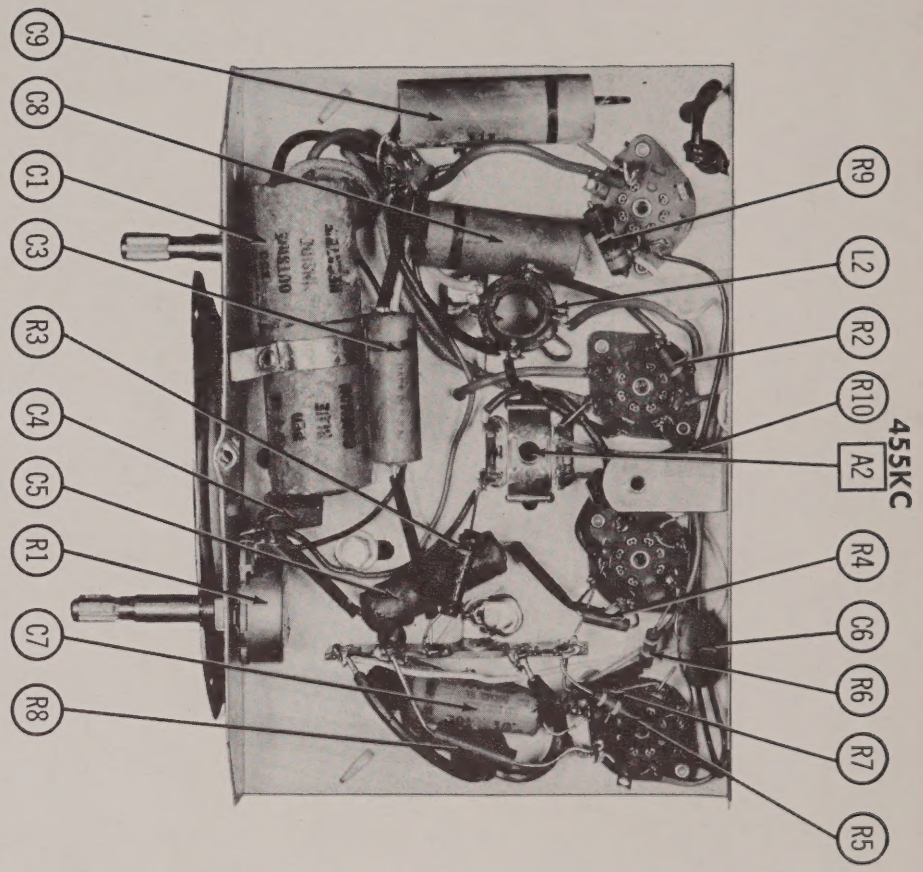
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	TRUETONE PART No.	MILLER PART No.	
L1	Ant. Coil	75Ω	2.7Ω	62-17	6300 *	
L2	Osc.Coil	.5Ω	6.2Ω	60-35		
L3	IF Trans.	20Ω	20Ω	61-14	12-C2	

* Drill mounting hole.

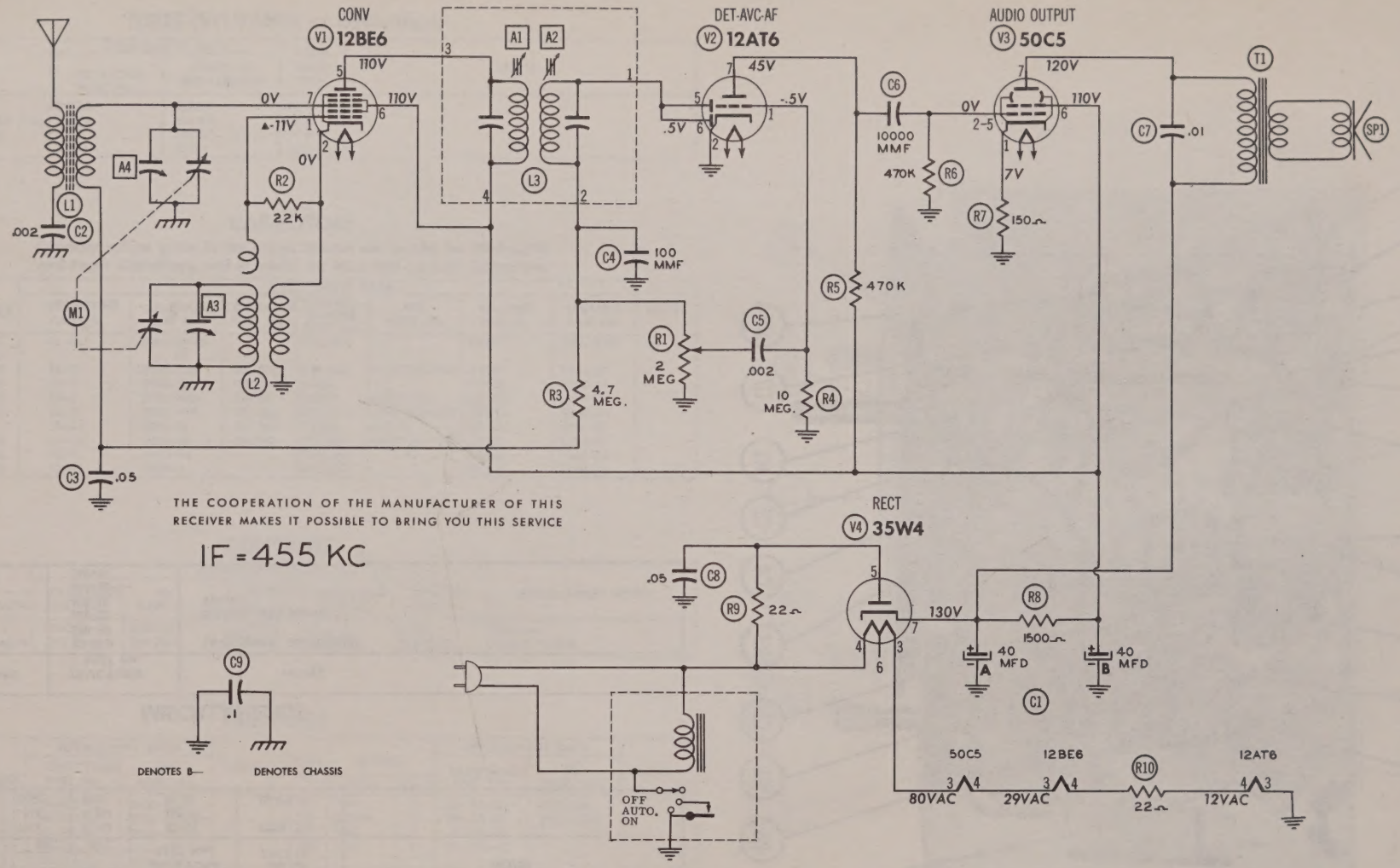
MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M1	Tuning Capacitor	30-15B	34-468MMF, 38-203MMF
	Cabinet	120-99	
	Knob	122-25	Selector with pointer
	Knob	122-15	Volume
	Back	125-65	
	Clock	140-21	

CHASSIS—BOTTOM VIEW



TRUETONE MODEL D-2205



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF = 455 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	50Ω	42Ω	†1.5KΩ	†1.4KΩ	6.7Meg
V 2	12AT6	10Meg	0Ω	0Ω	12Ω	2Meg	2Meg	†470KΩ
V 3	50C5	150Ω	470KΩ	100Ω	50Ω	470KΩ	†1.4KΩ	†200Ω
V 4	35W4	INF	INF	100Ω	120Ω	140Ω	110Ω	50KΩ

MEASURED FROM PIN 7 OF V4
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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6. Volume control at maximum, no signal applied for voltage measurements.